



*The*  
HOME UNIVERSITY  
ENCYCLOPEDIA



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Japanese Emperor, Hirohito, mingling with his people

*The*  
HOME UNIVERSITY  
ENCYCLOPEDIA

—An Illustrated Treasury of Knowledge—

*Prepared under the Editorship of*  
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WITH SPECIAL ARTICLES AND DEPART-  
MENTAL SUPERVISION BY 462 LEADING EDITORS,  
EDUCATORS AND SPECIALISTS IN THE  
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# VOLUME VII

## Hickory

**Hickory** (*Hicoria*), a genus of picturesque, hardy, deciduous American trees, belonging to the order Juglandaceae. There are twelve known species—one Mexican and the others restricted to the United States east of the Rocky Mountains. These trees are large and strong, and grow straight and symmetrical to a height of 60 to 90 ft. They bear pinnate leaves with serrate margins. The male flowers are borne in conspicuous catkins, and the female flowers in dependent aments which



Hickory 1, Male flower, 2, fruit, 3, peeled nut

are followed by large, dry fruits, containing edible nuts. Hickory wood is tough and strong, weighing about 50 pounds to the cubic foot, and is famous for its elastic and flexible qualities. It is used in the manufacture of farm implements, tool handles, hoops, and lighter vehicles, and is excellent for fuel. The most useful species are the pecan, an oblong, thin-shelled nut, and shag-bark hickories.

**Hickory**, town, Catawba co., North Carolina. The town is the seat of Lenoir College (Luth.), Claremont College for Women, and St. Paul's Lutheran Seminary, p. 7514.

**Hicks**, Elias (1748-1830), American

## Hierarchy

Quaker minister, was born in Hempstead, N. Y. He was influential in having the New York legislature pass the act of July 4, 1827, freeing all slaves in the State. In 1817 he vigorously opposed the attempt to adopt an orthodox creed with a view to uniting with the English Friends. His followers, termed Hicksites, outnumbered the others. See FRIENDS.

**Hidalgo**, a member of the inferior nobility in Spain. Their privileges were abrogated when constitutional government was set up.

**Hidalgo y Costilla**, Miguel (1753-1811), Mexican revolutionist, called the 'Father of Mexican Independence,' was born in Corrallegos, and became a priest in 1779. With Abasalo, Allende, and others he planned the revolt of 1810, proclaiming the revolution from his own church, and was made general of a poorly armed and undisciplined mob of 50,000, whom he led in a march on the city of Mexico.

**Hiddenite**, a green variety of spodumene containing chromium, to which its color may be attributed. It was discovered, about 1879, by William E. Hidden, for whom it is named, and is found near Stony Point, N. C. The emerald green variety is used as a gem.

**Hide** of land, an ancient English measure, the holding allotted to one freeman. It consisted of as much land as one plough could till in a year, together with woodland, pasture, and meadow sufficient to support the family, the servants, and the oxen.

**Hiel**, Emmanuel (1834-99), Flemish poet, was born near Dendermonde. He was one of the chief lyric forces of modern Flemish. He wrote *Gedichten*, *Nieuwe Liedekens*, *Liederen voor Groote en Klein Kinderen*, *Bloemekens*, *Bloemadinne*, the hymns, *De Wind* and *Vrijheidshymne*, the patriotic poems, *Belgenland* and *Eer Belgenland*.

**Hierapolis**, the 'Holy City', stands above the Lycus valley, in Phrygia, Asia Minor. There are considerable ruins, and the place is noted for the remarkable calcareous deposits from large springs. Strabo mentions the Plutonium, a hole reaching deep into the earth, from which issued a mephitic vapor.

**Hierapolis**, or **Hieropolis**, ancient city, Syria, Cyrrhestica. It was called *Bambyce* by the Greeks, and was one of the chief seats of the worship of Astarte.

**Hierarchy**, a general name for the entire

body of the clergy of a church, also government by priests

**Hieratic**, a style of ancient Egyptian writing. See **HIEROGLYPHICS**

**Hieroglyphics** This name was given originally by Greek and Latin authors to a kind of writing used in ancient Egypt, which was employed chiefly in official inscriptions, and which became peculiarly a part of the knowledge of the priestly classes, hence the name 'sacred writing'. To a large extent, the Egyptian hieroglyphics are obviously pictures of natural objects, and although it is now known that the symbols express not only words, but also syllables and letters, the term 'hieroglyphics' has acquired the general sense of picture-writing. Understood in this wider acceptation, hieroglyphic writing is the oldest and most primitive of all kinds of writing. Even some of the letters of the Roman alphabet, which we ourselves still use, may be traced back to the rude pictures from which they came. (See **ALPHABET**)

Picture-writing expresses not so much words as ideas. It is therefore termed *ideographic*, and the symbols used are called *ideograms*. Those who read the meaning of the symbols are free to choose their own words when they do so. It is a great step in advance when writing becomes a representation of speech. The final result is the complete transformation of the original picture-writing. The symbols represent words, and so cannot always be self-interpreting pictures. The ancient Egyptian system of writing can be traced for four thousand years or more, and throughout that time it preserved, in a striking manner, externally, its pictorial character. The modern decipherment of the Egyptian hieroglyphics was suggested and rendered possible by the discovery, in 1799, of the Rosetta Stone by one of the officers of Napoleon the Great. This stone contains a trilingual inscription. The first important attempt at decipherment was made by an English physician and scientist, Dr Thomas Young. But the credit of laying the foundations of our present knowledge of the Egyptian language and literature belongs chiefly to the French scholar François Champollion.

The Egyptian hieroglyphic system is by no means of a simple or primitive character. It is indeed partly ideographic. The representation of the sun stands not only for the sun itself, but also for the word 'day'. The figure of a man in the attitude of prayer expresses the concept of worship. Side by side with such primary symbols are combinations of

simple picture-signs, used to express conceptions too complicated for representation by a simple character. For the most part, however, the hieroglyphic signs are not ideographic or expressive of words, they are phonetic—they express sounds, both syllables and simple sounds. Certain picture-signs which originally denoted words came to denote merely the first letters of these words. In fact, the Egyptians continued to use, side by side, intermixed with one another, three kinds of characters—ideographic, syllabic, and alphabetic. To a certain extent the cuneiform inscription in the Sumerian (often called Accadian), Assyrian, and Babylonian syllabaries seem to have been pictorial in origin. The peculiar wedge-shaped appearance of every stroke in the ordinary characters is due to their having been printed on clay tablets with an instrument of a certain shape. But in the oldest documents the lines are ordinary straight lines. There are more than four hundred signs in general use. Of these it is maintained that the vast majority are composite. Only some forty-five can be reckoned as primitive. It is generally supposed that this cuneiform writing was the invention of a non-Semitic people, and that it was adopted from them by the Babylonians and Assyrians. They, in turn, passed it on to other peoples, such as the Persians and the Urartian inhabitants of the region of Lake Van in Armenia. Among the Persians the signs acquired, for the most part, an alphabetic value. (See **CUNEIFORM**).

Chinese writing has an independent history curiously parallel, in some respects, to these other systems. The forms of certain of the signs in their earliest known shape make it clear that they were originally pictorial. The Chinese themselves distinguish a large number of such signs. Chinese also supplies an example of the transition from a pure ideographic system to a mixed system in which phonetic characters are employed. These phonetic characters, denoting sounds, are by far the most numerous in Chinese writing. The language is now rich, however, in words which are pronounced similarly, though with different 'tones,' and which are quite different in meaning. Every word has practically a special sign of its own, and the total number of separate characters in the language is enormous. The Chinese system of writing is perhaps the most cumbrous that has ever existed. See **ALPHABET**, **PICTURE-WRITING**. Consult Clodd's *Story of the Alphabet*, Hilprecht's *Explorations in Bible Lands* (1903),

Brinton's *Primer of Mayan Hieroglyphics*

**Hieronymites** (from Hieronymus, better known as St Jerome), an order of hermits, constituting a branch of the Franciscans, was founded by Thomas of Siena in the 14th century. The order is also known as 'Brethren of Good Will,' and 'Gregorians.'

**Hierro, or Ferro**, island of the Canary Islands, of volcanic origin, with mountains reaching a height of over 4,000 ft. The island produces apples, quinces, plums, and chestnuts, and is especially noted for almonds and figs, p 7,000

**Ferro** was in early times accounted the most westerly of known lands, and its meridian is said to have been used as the prime meridian by Ptolemy (2d century AD)

**Higgins, Andrew Jackson** (1886- ), American shipbuilder and motor boat manufacturer, was born in Columbus, Neb. At the Higgins Industries, Inc. plant in New Orleans ships and planes were built in World War II.

**Higginson, Ella Rhoads**, American author, was born in Council Grove, Kans. Her short story, *The Takin' In of Old Mis' Lane*, won McClure's \$500 short-story prize. Among her books are *The Flower That Grew in the Sand* (1896), *Alaska, the Great Country* (1908), *The Message of Anne Laura Sweet* (1914). She died 1940.

**Higginson, Thomas Wentworth** (1823-1911) American author and lecturer, was born in Cambridge, Mass. He early became prominent as an advocate of woman suffrage. After the war he became widely known as a trenchant writer and speaker on literary, historical, and social subjects. His writings hold a high place in American letters. His works include *Outdoor Papers* (1863), *Army Life in a Black Regiment* (1869), *Oldport Days* (1873), *Short Stories of American Authors* (1879), *Common Sense about Women* (1881), *Margaret Fuller Ossoli* (1884), *Larger History of the United States* (1885), *Contemporaries* (1899), *Longfellow* (1902), and *John G. Whittier* (1903), *Part of a Man's Life* (1905), *Life of Stephen Higginson* (1907), *Carville's Laugh and Other Surprises* (1909). Consult Bentzon's *A Typical American*, M. P. Higginson's *T. W. Higginson: The Story of his Life* (1914).

**Highgate**, residential suburb of London, England. The town has many interesting old houses, among them Cromwell House. Other features of interest are the Whittington Almshouses, Islington Infirmary, St. Joseph's Retreat, the mother-house of the Passionist Fathers in England, and Waterlow Park, one

of the most beautiful municipal parks in London. In Highgate Cemetery are buried Lord Chancellor Lyndhurst, Herbert Spencer, Faraday, and George Eliot, while Coleridge's remains lie in the old burial-ground. Whittington's Stone is believed to mark the spot where Whittington heard Bow Bells and turned again.

**Highhole**, a large, brownish, 'golden-winged' woodpecker, common throughout the United States. See WOODPECKER.

**Highland** is a term used in geography in opposition to lowland, but no exact limit of height can be given. The term highland is used to distinguish rugged lands from relatively flat lands. In this sense the word is best applied to distinguish denudation mountains, such as the Scottish or Scandinavian Highlands, from tectonic mountains, such as the Alps, or tablelands like Arabia.

**Highlanders**. See HIGHLAND REGIMENTS.

**Highland Falls**, village, New York. On the north it adjoins the grounds of the U. S. Military Academy at West Point and 3 m. to the south is Bear Mountain Park. The village commands a magnificent view of the Hudson, and is a well-known summer resort, p 2,588.

**Highland Fling**, a national dance of Scotland, generally danced by one person. The music is usually highly syncopated. The name is derived from the action of the dancer, who dances alternately on each leg, flinging the other out before or behind.

**Highland Regiments**, Scottish regiments of the British army whose uniform is the Highland dress with a kilt of the distinctive tartan. There are eight of these regiments, the oldest of which, the Black Watch, was organized in 1739 as the Forty-Second Regiment. The personnel is not now confined to Scottish officers and men. The Highland Regiments have been distinguished by courage, daring, and a high degree of patriotism, and during the Great War their traditions were nobly maintained.

**Highlands**, a region in the n and n.w. of Scotland. It has no political or civil boundary, but in general includes the territory lying north of a line drawn from Nairn, on the Moray Firth, to Dumbarton on the Clyde, as well as certain parts of the counties of Banff, Moray, Aberdeen, Kincardine, and Perth. See SCOTLAND.

**Highlands of the Hudson**, a ridge of the Appalachian system lying mainly in Putnam, Orange, and Dutchess counties, New York. It rises in imposing and picturesque peaks on both sides of the Hudson River. West Point

(1,500 ft) and Storm King (1,389) on the west bank, and Breakneck (1,635) and Anthony's Nose (1,048) on the east, are among the best known of these

**Highness**, an honorary title used in speaking of or addressing princes, grand-dukes, and minor crowned rulers, who, generally speaking, are not independent. The title was used by the kings of England up to the time of James I, when it was officially changed for 'Majesty'. The children of emperors are 'Your Imperial Highness', the children of kings, 'Your Royal Highness'.

**High Place**, the literal translation of the Hebrew *Bāmāh*, signifying a place of worship. These high places were the altars of the early Israelite period. Each town and village possessed its own place of worship, which was frequently situated on a hill overlooking the town.

**High Priest**, the head of the Israelite priesthood. According to the writing known as P, the first high priest was Aaron, who was succeeded by his son Eleazar, from whose line the later holders of the dignity were required to be taken. The high priest was distinguished from the ordinary priests by his elaborate and costly robes, together with the ephod and the breastplate, the receptacle of the Urim and Thummim. His special prerogative was to enter the Holy of Holies on the Day of Atonement. He was under more stringent rules regarding purity than his inferior brethren. For example, he was permitted only to marry a virgin, he was prohibited from touching a corpse, even that of his father or mother, and from manifesting the customary signs of mourning.

**High Schools**, in the United States, are public schools offering instruction in subjects between the elementary school and college grades. During the past fifty years the high school has largely superseded the older academy or secondary school of the classical type. Seven lines of work have been declared by the High School Teachers' Association to be essential: language, mathematics, history and civics, science, music, drawing, and manual training. The usual length of the course is four years, the average age of the pupils at entrance is thirteen.

The adjustment of the high school curriculum to modern economic and social conditions has brought about the inclusion of numerous scientific and technical subjects.

**High Seas**, the open ocean stretching beyond the limit of territorial jurisdiction of states or nations having a maritime coast line.

This limit is usually the low-water mark, though a certain jurisdiction, properly exercisable by the admiralty courts, may be exercised to a distance of three miles from the shore.

**High Steward**, formerly the highest officer of state in England. It is, however, revived for special occasions, such as a coronation or the trial of a peer.

**Highway**, a way subject to the use of the public for passing and repassing. It may be a road, or only a footpath or trail, or it may be a stream open to navigation, or a bridge or ferry. As the public acquires no title to the land subject to its use, but only a right of user in the nature of an easement, no conveyance is necessary to create the right.

**Highwayman**. In the 17th and 18th centuries highwaymen were to be found on every high road in England. The nature of their calling made it essential that they should be good riders and well mounted, hence, in order to escape detection, they were obliged to maintain the appearance of gentlemen. Although a few of them were of good birth and education, the majority of the 'gentlemen of the road,' as they called themselves, were far below the level at which fiction has represented them. Among the most famous were Claude Duval (1643-70), Jonathan Wild (?1682-1725), Jack Sheppard (1702-24), Dick Turpin (1706-39), Jerry Abershaw (1773-95), and John Nevison (hanged at York, 1684).

**Highways, National**. In the United States, this term is applied chiefly to roads and highways as distinguished from urban streets, and these are usually constructed under joint Federal and State supervision. Certain highways or thoroughfares which serve as trunk lines, and extend over long distances and beyond State limits, are also known as National Highways. In early times highways were the only means by which access was had to various parts of land territory, as distinguished from sea travel, and many roads—notably those built in Europe by the Romans—are still in an excellent state of preservation.

The earliest roads in the United States were Indian trails along watercourses and through gaps in the mountains. Thoughtful men early recognized the value of good roads, and Washington suggested the necessity of developing a central State body which should have as its function the promotion of a movement for better roads, and for more effective administrative supervision of their construction and maintenance. In 1796 Congress authorized a national road from Baltimore westward,

which was built for 650 m through Pennsylvania, Ohio, and Illinois. In 1803, there was created in the Department of Agriculture an *Office of Public Roads and Rural Engineering* whose activities were at first limited to testing and research work, but now embraces the studying of systems of road management and methods of road building, improvements, and maintenance. The most important legislation ever enacted in this connection was the passage in 1916 by Congress of the *Federal Aid Road Act*, the provisions of which are under the direction of the Department of Agriculture. This Act had for its purposes to promote

and the Southern National Association, have devoted themselves to the exploitation of special routes, and they have been particularly successful in arousing public sentiment. The most important and typical of these routes is the Lincoln Highway, which is 3,284 m long, and extends from New York to San Francisco by way of Trenton, Philadelphia, Lancaster, Pittsburgh, Fort Wayne, Omaha, Cheyenne, Reno, and Sacramento, passing through 12 States on its way.

The Dixie Highway, whose combined length is 3,989 m, passes through the following cities: Miami, Fla., Jacksonville, Fla., Atlanta, Ga.,



*View of a National Highway*

construction of rural post roads by granting aid to the various States to provide further money aid toward the construction of roads and trails wholly or partly within the national forests, and to encourage supervision of roads within the State by competent officials.

Prior to the passage of the Federal Aid Road Act there had been organized various national organizations, including the American Highway Association, the American Road Builders' Association, and the National Highway Association, each of which did much good toward the cause of improved highways. A number of organizations, such as the Lincoln Highway Association, the Dixie Highway Association, the Jackson Highway Association,

and Chattanooga, Tenn., where it branches. The eastern branch passes through Knoxville, Tenn., Lexington, Ky., Cincinnati, Dayton, Toledo, Detroit, and Saginaw, to Sheboygan, Mich. It then circles along the coast of Lake Michigan through Grand Rapids, to Indianapolis, where there is a spur line west to Chicago, and also a connection east to Dayton. From Indianapolis it continues through Louisville, Nashville, back to Chattanooga. The Jefferson Highway is 1,600 m in length, and extends from Winnipeg, Canada, through St. Paul, Des Moines, Kansas City, Joplin, Mo., to New Orleans. The Jackson Highway is 1,600 m in length, and extends from Chicago, through Indianapolis, Louisville, Nashville,

Birmingham, Ala., Jackson, Miss., to New Orleans. The Meridian Road has a combined length of 2,300 m, and extends from Winnipeg, Canada, through Grand Forks, N. D., Watertown, S. D., Columbus, Neb., Wichita, Kans., Fort Worth, Tex., to Waco, Tex., where one branch continues to the Gulf Coast at Galveston, and the other through Austin and San Antonio to Laredo on the Mexican border.

The Alaska Highway, 1,671 m long from Dawson Creek, Canada, to Fairbanks, Alaska, was completed in 1942. Of the S. American branch of the Pan- or Inter-American Highway, begun in 1924, many sections have been built. World War II accelerated the work.

**Hilaria** was one of the great festivals of Roman people, and was celebrated on March 25. All mourning garments were put off, and good cheer and merry-making was indulged in, and an effigy of Attis, the mother of the gods, was borne through the streets in solemn procession. The *Hilaria* indicated the rebirth of nature after the long winter sleep.

**Hilarion**, founder of the monastic system in Palestine. His memory is celebrated on Oct. 21.

**Hilary, St.** (?320-368), bishop of Poitiers, born at Limonum (Poitiers), and converted to Christianity about 350. In 353 he was chosen by popular acclamation bishop of Poitiers, and devoted himself to a struggle with Arianism. The church holds his day on Jan. 13. Hilary's writings are valuable for the history of the Arian party and the successive phases through which it passed. He is often styled 'Malleus Arianorum' and the 'Athanasius of the West,' and was formally recognized as 'universe ecclesiae doctor' by Pius IX. in 1851. A celebrated hymn attributed to him is the 'Beati nobis gaudia Anni redeunt orbita', early inserted in Western liturgies.

**Hilary, St., of Arles** (c. 401-449), was born in Southern Gaul. He entered the monastery of Lerins, but was recalled to assist the bishop of Arles, and became his successor (427). As metropolitan of Arles (*Arelate*) he presided at several synods, and especially at Orange in 441, the proceedings of which involved him in a controversy with Pope Leo the Great. His day is May 5.

**Hilbert, David** (1862), German mathematician, was born in Königsberg. Hilbert has had a tremendous influence upon progress in the mathematical sciences, his greatest achievement being the reduction of geometry to a system of axioms. His chief published work is *Grundlagen der Geometrie* (3d ed. 1913, Eng. trans. 1910).

**Hilda, St.**, the patroness of Whitby, England. In 657 she founded the monastery at Streoneshalh or Whitby, a double house for nuns and monks, over which she ruled for 22 years, dying in 680. Bede tells us that Cædmon was a servant in the monastery.

**Hildebrand**. See GREGORY VII.

**Hildegard, St.** (1098-1179), religious mystic, born in Bockelheim in Germany. In 1147 she founded a monastery at Bingen, which she ruled until her death.

**Hildesheim**, town and episcopal see, Hanover, Prussia. During the 11th and 12th centuries many fine specimens of Romanesque architecture and ornamentation were erected here, and in the 15th and 16th centuries numerous examples of Renaissance work. To the former belong the Cathedral, and the Churches of St. Godehard and St. Michael. The gem of the latter period was the Guild House of the butchers (1529), destroyed by fire in 1908. The Wedekind House, the Templar House, and many private residences also illustrate the German timber-framed style of buildings at its best. Other buildings of note are the Town Hall (15th century), the Romer Museum, the Churches of the Magdalene and St. Andrew, Trinity Hospital, the Pfeiler House, and the St. Michael Monastery. On the Gilgenberg, c. of the town, a treasure trove of valuable Roman silver (dinner service, etc.) was discovered in 1868, which is now preserved in Berlin, p. 50,246.

**Hildreth, Richard** (1807-65), American historian and journalist, was born in Deerfield, Mass. He was a founder (1832) and for many years editor of the Boston *Atlas*. His most important work is his *History of the United States* (6 vols., 1849-52).

**Hilgard, Eugene Woldemar** (1833-1916), German-American geologist and chemist, born in Zweibrücken, Germany. In 1875 he became professor of agricultural chemistry and director of the experiment station of the University of California (professor emeritus 1909). In 1894 he was awarded the Liebig medal for distinguished services in agricultural science. His works include *Report on the Agricultural Features of the Pacific Slope* (1882), *Soils of the Arid and Humid Regions* (1906), *Agriculture for Schools of the Pacific Slope* (with W. J. V. Osterhout, 1909).

**Hill, Adams Sherman** (1833-1910), American teacher, was born in Boston. His text books on rhetoric are standard works, and include *Principles of Rhetoric* (1878), *Foundations of Rhetoric* (1892), *Beginnings of Rhetoric and Composition* (1902).

**Hill, Ambrose Powell** (1825-65), American soldier, was born in Culpeper co Va At Gettysburg he commanded the Confederate center, and it was the accidental meeting of one of his divisions with a force of Federal cavalry under Buford that precipitated the battle He led his corps through the remainder of the war until he was killed at Petersburg, Va, while reconnoitering (April 2, 1865)

**Hill, Daniel Harvey** (1821-89), American soldier and scholar, was born in York District, S C He took a conspicuous part in the Peninsula Campaign, participated in the Battles of Beaver Dam Creek and Guinea's Mill, won distinction at South Mountain and Antietam, was in command of the Richmond and Petersburg defenses during the Gettysburg campaign He published religious tracts, and wrote several chapters in Johnson and Buel's *Battles and Leaders of the Civil War*

**Hill, David Jayne** (1850-1932), American author and diplomat, was born in Plainfield, N J In 1898-1903 he was assistant Secretary of State, in 1903-05, U S Minister to Switzerland, in 1905-07, Minister to the Netherlands, and in 1908-11, Ambassador to Germany He is a member of the Permanent Administrative Council of the Hague Tribunal, and was a delegate to the Second Peace Conference (1907) His published works include *Lives of Washington Irving* (1887) and of William Cullen Bryant (1878), later writings include *The People's Government* (1915), *Impressions of the Kaiser* (1918), *The Problem of a World Court* (1927)

**Hill, George Birkbeck** (1835-1903), English author, was born at Tottenham, Middlesex He was a noted reviewer, who made *The Saturday Review* celebrated for its sarcasm, and he was distinguished as the editor of the supreme edition of Boswell's Johnson His principal works deal with Dr Johnson, Sir Rowland Hill, Colonel Gordon, Dean Swift, Edward Gibbon, *Rasselas*, and Rossetti

**Hill, George William** (1838-1914), American astronomer, was born in New York City His researches in celestial mechanics rank permanently among the memorable achievements in that domain His most important contribution in book form is *A New Theory of Jupiter and Saturn* (1890)

**Hill, James Jerome** (1838-1916), American railway promoter, was born in Rockwood, Ontario, Canada During his administration the Great Northern Railroad was extended to Puget Sound, on the Pacific Coast, and placed in direct communication with China and

Japan through the organization of the Japanese Navigation Company He organized the Northern Securities Company, against which the Government proceeded in 1903 (see TRUSTS) Besides being a director of the Great Northern, the St Paul, Minneapolis, and Manitoba, and other railroads, J J Hill was a director of the First National Banks of New York City and Chicago, and vice-president of the New York Chamber of Commerce He gave liberally to many institutions, his benefactions including a gift of \$500,000 for establishing a Roman Catholic theological seminary in St Paul, and \$1,500,000 for the Roman Catholic cathedral in that city He was a collector of works of art, his collection of the modern French school being especially fine In 1910 he wrote and published *High ways to Progress*

**Hillel** (c 50 B C-?10 A D), called HABAHLI, 'the Babylonian,' and HAZAKANI, 'the elder,' one of the greatest and most influential doctors of the Jewish law, was born in Babylon He was the first who collected the numberless traditions of the oral law, and arranged them under six heads His doctrine has often been compared with the early teaching of Jesus

**Hiller, Ferdinand** (1811-85), German musical conductor pianist, and composer, was born in Frankfurt-on-the-Main His permanent reputation rests on his work at Cologne (from 1850) as founder of the conservatorium, of which he was director and conductor acting also as director of the musical festivals there Works Chamber music, two oratorios, six operas, etc

**Hillman, Sidney** (1887-1946) U S labor leader, born in Russia In Jan 1941 he became associate director general of the Office of Production Management, and later was named to represent labor on the Supply Priorities and Allocations Board He was president Amalgamated Clothing Workers (1915-46), member Labor Advisory Board (1933), vice-president CIO (1937-46)

**Hillquit, Morris B** (1869-1933), American socialist, was born in Riga, Russia, and emigrated to the United States in 1886 He has been prominent in the councils of the Socialist Party, and chairman of the national committee His published works include *The History of Socialism in the United States* (1903), *Socialism in Theory and Practice* (1909), *Socialism Summed Up* (1912), *Socialism—Promise or Menace?* (1914), *From Marx to Lenin* (1921)

**Hillsdale**, city, Michigan Hillsdale Col



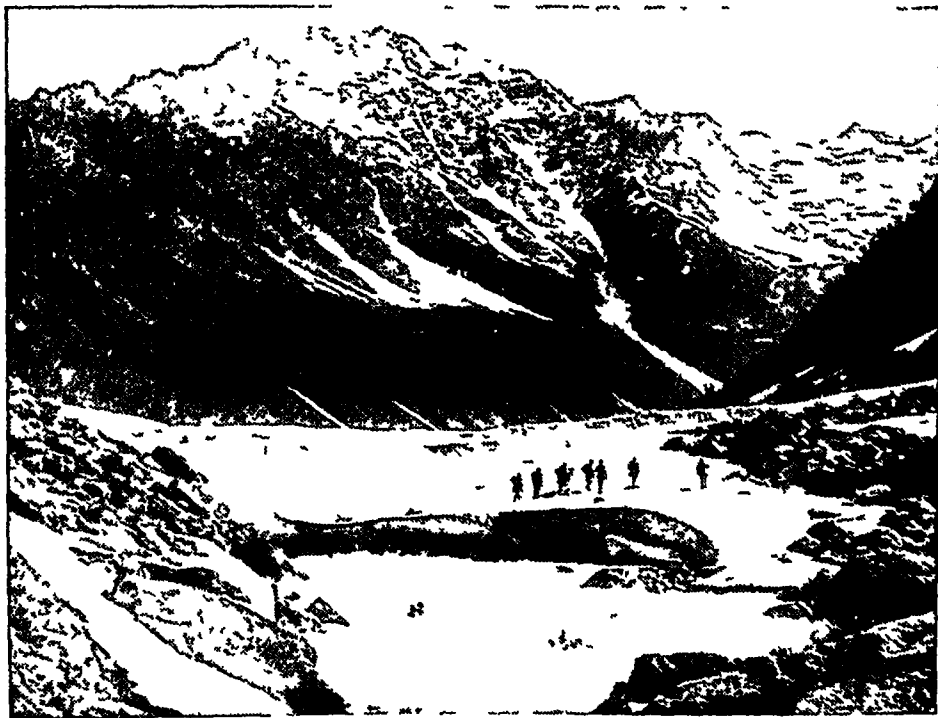
lege (Baptist) is located here, p 6,381

**Hilo**, town and seaport, on the e coast of the island of Hawaii. The volcano of Kilauea, 28 m n w, attracts numerous visitors, p 19,468

**Hilprecht, Hermann Volrath** (1859-1925), German-American Assyriologist, was born in Hohenersleben. In 1893-1909 he reorganized the Babylonian section of the Imperial Ottoman Museum at Constantinople. He was editor-in-chief of the *Bulletins* of the University of Pennsylvania's expeditions to Babylon, and published *Freibrief Nebuch-*

to include the mountain system lying between the southward bend of the Indus (in  $75^{\circ}$  E and  $36^{\circ}$  N) on the w, and the southward bend of the Tsangpo, or Brahmaputra (in  $94^{\circ}$  E and  $30^{\circ}$  N), on the e. The area thus included extends about 1,600 m in length, with an average breadth of about 200 m, increasing toward the n w to nearly thrice that distance.

The highest peaks are Nanda Devi, 25,600 ft, Dhaulagiri, 26,826 ft, Everest, 29,141 ft (the highest known point on the globe), Godwin-Austen, 28,250, Gusherbrum, 26,378, Masherbrum, 25,600, Kakapushi, 25,560,



Scene in the Himalayas

*adnezar's I* (1883), *Old Babylonian Inscriptions* (1893), *The Oldest Version of the Babylonian Deluge Story and the Temple Library of Nippur* (1910)

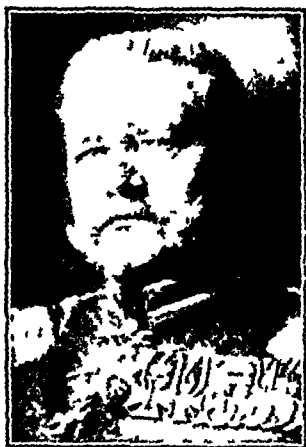
**Hilton, James** (1900- ), English novelist and short story writer. His first novel, *Catherine Herself*, was published in 1920. His other works include *And Now Goodbye* (1931), *Lost Horizon* (1933), *Goodbye, Mr Chips* (1934), *We Are Not Alone* (1937), *Random Harvest* (1941), *Story of Dr Wasell* (1945). He came to the U S in 1935.

**Himalayas**, (Sans *him*, 'cold', *alaya*, 'abode'). Geographically, it may be held

Chumaliri, 23,946, Kutha Kangri, 24,740, and Kunchinjunga, 28,146. In 1924 Dr T H Somervell reached 28,000 ft on Mount Everest and in 1934, the first airplane journey over Mt Everest was successfully completed. In 1931, Mount Kamet, 25,447 ft high, was scaled by a British expedition under the leadership of Frank S Smythe.

The routes across the Himalayas are few and difficult. Nevertheless, those across the Karakoram and the central range into Kashmir, as well as those from South Tibet into Nepal and Sikkim, are considerably used by traders. The passes of the chief ranges are

the most elevated on the globe, seldom falling below 15 000 or 20 000 ft. The mean snow line on the Indian slope of the Himalayas runs at about 15 000 ft. On the northern side it rises to 18 000 ft., and in the Karakoram to 20 000 ft. Among the loftiest passes are the Ili-Gramin (20 457 ft.) into Garhwal, the Pirang Pass (18 500 ft.) in Spiti and the Salto Pass (18 700 ft.). The snow region of the Himalayas is plentifully studded with glaciers, some of them of great extent. The longest in the Himalayas, and probably the largest outside the Alaskan and Polar regions, is the Siachen in the Karakoram, over 4½ m. long.



Paul von Hindenburg

In the lower, hotter, and moister parts of the Himalayas, chiefly towards the e., the flora is closely related to that of the Malay Peninsula and islands. Farther w., as the drier, colder parts are approached, it approximates to the European flora. Cultivation does not ascend higher than 7,000 ft., except in a few of the warmer valleys. In respect of its fauna this region is one of the richest in the world, particularly in birds. Within Indian territory most of the inhabitants of these mountains are Hindus. The Tibetan portions are occupied by people of Turanian stock.

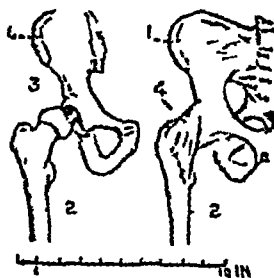
Himmler, Heinrich (1900-1945), Nazi German Minister of the Interior, General Plenipotentiary for the Reich, and chief of the Gestapo, the secret police during the Hitler regime in Germany. It was his business to suppress opposition to or criticism of that regime in the countries occupied by Germany as well as inside Germany. He committed suicide May 23, 1945.

Hinayāna, ('Lesser Vehicle'), one of the two sects or schools of religious and philosophical learning in northern Buddhism, the other being the Mahāyāna.

Hincks, Sir Francis (1807-85), Canadian legislator and journalist, was born in Cork, Ireland. As premier he negotiated a commercial treaty with the United States. He edited *The Farmer*, *Montreal Pilot*, and *Montreal Journal of Commerce*. His publications include *Canada* (1840), *Political History of Canada Between 1830 and 1855* (1877).

Hind, John Russell (1823-95), British astronomer, was born in Nottingham, England. He was sent in 1841 as one of the commission appointed to determine the exact longitude of Valparaiso. Between 1847 and 1854 he discovered ten minor planets. In 1853 he undertook the editing of the *Nautical Almanac*. His works are the *Astronomical Vocabulary*, *The Comets*, *The Solar System*, *Astronomy*, and *Descriptive Treatise on Comets*.

Hindenburg, Paul von Beneckendorff und von (1847-1934), German soldier and public official, was born in Posen. Following the outbreak of the First World War, and the Russian invasion of East Prussia, he was recalled and given command of the Eighth Army. By a bold and hazardous strategy he won the great victory of Tannenberg, Aug. 26-31, 1914, and at once became a popular



Hip-joint, front and back view  
1, Haunch bone, 2, femur, 3, round ligament, 4, capsular ligament

idol. He was made a field marshal the following November and was placed in chief command of the Austro-German forces on the Eastern front. In August 1916 he succeeded General von Falkenhayn as chief of the General Staff. After the signing of the Armistice von Hindenburg retained the chief command until June 1919. He did good service in dis-

banding the armies and even offered himself to the Allies to be tried in place of the former Kaiser. He was the object of numerous demonstrations by German monarchists and in 1925 was elected president of the German republic, decisively defeating the Republican candidate. Hindenburg's great age and his aloofness from the clamor of Reichstag politics made him a legendary figure in the last years of his Presidency. His patriotism and sense of duty engaged the admiration even of nations which had been at war with Germany. The end of his career was dimmed by the rocket ascent of Adolf Hitler's fortunes and when the venerable statesman accepted the Nazi orator as Chancellor (1933) it was obvious to the world that the President's day was done. To Germany, Hindenburg symbolized the greatest and humblest moments of her history and his sarcophagus on the Tannenberg field has become a national shrine.

**Hinduism** is commonly used to include Brahmanism, but for the purposes of this article may be confined to those complex religious systems which were evolved out of the Vedic worship of the one supreme being, Brahma. Pure Brahmanism is monotheistic, Hinduism is polytheistic. Yet Hinduism is the offspring of Brahmanism. The doctrine of the Trimurti, or trinity, embraces the triple manifestation of the godhead as Brahma the creator, Vishnu the preserver, and Siva the destroyer.

In theory the Trimurti is acknowledged, but in practice worship is confined to one god. At the present day, outside the modern Unitarian churches of India, which claim to have reverted to pure Brahmanism, the worship of Brahma is confined to a comparative handful of Hindus. Siva, the third person of the trinity, has been elevated to the position of Mahadeva, the great god. He has to be approached with fear and trembling, and is altogether too severe and stern a deity for the multitude, therefore in Vishnu, kind and gentle, we have the popular god of the Hindus. The attitude of Hinduism towards other faiths is tolerant, or one of indifference. The influences of the Christianity which the Hindu hesitates to accept are certainly making themselves felt in many directions, notably in the amelioration of the condition of women. See **BRAHMANISM**, also **VISHNU**.

**Hindu Law** It is claimed for Manu, the legendary Hindu lawgiver, that he received the commandments from the deity. The precepts which he promulgated were at length amplified in 'commentaries,' which, though not received

as divinely inspired, were yet recognized as the work of Brahman experts. These 'commentaries,' most of which were compiled between the 11th and 15th centuries, are so colored by local conditions and local customs, which to this day in India are strong enough occasionally to supersede the written law, as to differ markedly from each other, and Bengal and Western India, Benares and Southern India, have each their separate 'schools.' The subjects dealt with are almost entirely confined to matters of caste, questions of property, inheritance, succession, adoption, and maintenance, and the laws relating to marriage, divorce, etc., they concern the family and the individual more than the community.

**Hindu-Kush**, a westward prolongation of the Himalayas, from which it is separated by a gorge of the Indus R.

**Hindustan** 'the country of the Hindus', a term sometimes applied to British India generally, or to that part of it which lies between the Himalaya and Vindhya Mountains, from the Punjab in the west to Bengal in the east. This term is now seldom used.

**Hingham**, tn., Plymouth co., Mass. The Old Meeting House, built in 1681, is the oldest house of public worship in the U. S. which has been continuously in use, p. 8,003.

**Hinterland** The notion that the region beyond and behind that occupied by colonists or traders belongs to them by right because necessary for expansion and growth, was in the minds of some of the very earliest colonists. The doctrine reappeared in S. Africa when, in 1884, Cecil Rhodes demanded that the imperial authorities should annex Bechuanaland and Stellaland, to preserve the right of the colony to expand towards the north. The doctrine received its German name, and its most striking application, from the sudden development of the desire of the Germans for colonies in the days of Bismarck.

**Hip-Joint** The hip is an enarthrodial or ball-and-socket joint, the rounded head of the thigh bone or femur fitting into the acetabulum, a cup-shaped socket on the outer aspect of the haunch bone. The commonest ailment of the hip is strumous disease, which may arise from some slight injury, such as a bruise, but which ultimately shows characteristic tubercular infection of the synovial membrane or of the bone. A disease attacking the hip in older patients is rheumatoid arthritis, sometimes called morbus coxae senilis, in which considerable masses of bone are deposited around the joint, so that it be-

come fixed and useless. Dislocation of the hip-joint is not uncommon and in old people it is frequently accompanied by fracture of the neck of the femur.

**Hipparchus**, the greatest of Greek astronomer, observed in Rhodes from 160 B.C. He invented trigonometry, discovered the precession of the equinoxes, originated our present system of geographical co-ordinates and employed eccentrics and epicycles to explain the celestial movements. His catalogue of 1,080 stars is preserved in Ptolemy's *Almagest*.

**Hipparion**, one of the fossil ancestors of the horse, the remains of which are found in the Pliocene strata of Africa, India, and China, and in the Upper Miocene of North America. It was about four ft. high at the shoulder, and had lateral toes on each side of the feet, which were complete though small.

**Hippocampus**, a name applied by the Greeks to the mythical sea horse is used as a generic term for certain curious little fishes having a head somewhat resembling that of the horse. The sea-horses belong to the same order as the pipe fish, and have compressed bodies and prehensile tails devoid of a caudal fin. They are in the habit of coiling their tails round weeds and are often carried great distance in this way.

**Hippocrates**, ancient Greek medical man. He was born in the island of Cos probably about 460 B.C., and there he lived and practiced, though he traveled widely in Greece and died in Larissa, Thessaly. In his medical practice he was cautious, trusting chiefly to the operations of nature, and to the effects of diet and regimen. As to surgery his maxim was, that 'what cannot be cured by medicine must be cured by the knife, what cannot be cured by the knife must be cured by fire.' He classified the fluids or humors of the body as blood, phlegm, black bile and yellow bile, the right combination of which resulted in health, and any disturbance of which caused disease. His most important genuine works are *Prognostics*, *Aphorisms*, *Of Epidemic Diseases*, *About Air, Water, and Places*, and *Wounds of the Head*.

**Hippocratic Oath**. See Oath, Hippocratic.

**Hippodrome**, the ancient Greek course for chariot racing or horse racing. It was oblong, with a semicircular end, and its length was probably about 4 or 6 stadia. The competing chariots or horses must round a pillar or other mark at the farther end, and return to the starting-point. This turn was the critical point of the race, as may be seen from the

descriptions of chariot races in the *Iliad* and in the *Electra* of Sophocles. One of the most famous was that at Constantinople, begun by Septimius Severus and finished by Constantine the Great, another famous one was at Olympia.

**Hippogriff**, or **Hippogryph**, a fabulous animal, represented as having the winged body of a horse with the head of a griffin. The figure was much used during the Renaissance.

**Hippolyte**, in ancient Greek legend, the queen of the Amazons. Tradition says that she and the Amazons invaded Attica, but was conquered by Theseus, who married her. See Shakespeare's *A Midsummer Night's Dream*.

**Hippolytus** (c. 160-236), Christian writer, is supposed to have been born in the East, and to have died in exile in Sardinia. He was at one time a presbyter at Rome or, according to some writers, bishop of Rome. A treatise generally ascribed to Hippolytus throws much light on early church history.

**Hippopotamus**, a large African artiodactyl mammal, belonging to the division Suinae, or pig-like forms. The bulk of the body may reach a length of over 24 ft. with a height at the shoulders of 7 ft. 3 inches. The legs are very short and thick, the head enormous, with an angular and expanded muzzle, the body deep so that when the animal walks on soft mud the under surface touches the ground. The tail is short and compressed, the eyes small but projecting, the ears rounded, both ears and nostrils can be closed at will. Each foot bears four toes, partly webbed, which are almost equal in size, and all touch the ground in walking. The skin is nearly naked, bearing only a few bristles. The mouth is huge.

The hippopotamus is essentially an aquatic animal spending most of its time floating at the surface, or wallowing about at the bottom of the water rising, it intervals to breathe. It is nocturnal in habit, being drowsy and languid during the day, but at night leaving the water to graze on the banks. In cultivated regions these animals often cause great damage to crops. It is hunted for the sake of the hide, which is of enormous thickness, and for the fat, but the ivory of the tusks is now little esteemed.

**Hippuritidae**, a group of fossil lamellibranchs, which are peculiar to Cretaceous strata. The two valves of the shell were dissimilar, the lower (right) valve being large, often conical or cup-shaped, while the smaller (left) valve was flattened, small, and served as a lid to close the orifice of the cavity in the other. The hinge was large and strong, with

powerful teeth, and large, prominent ridges for the attachment of the muscles. The outer surface was ornamented with ridges and furrows.

**Hipurinas**, South American Indians, widespread in West Brazil. The Protestant missionaries have reduced their polysynthetic language to written form, and have published a grammar and vocabulary. They number at present less than 3,000.

**Hirado**, island, Japan, in the Strait of Korea, off the west coast of Kiushiu. At one time it was a great emporium for trade, and in modern times it gives its name to a well known variety of blue porcelain.

November of that year, owing to his father's illness, was appointed Regent of the Empire. On Jan. 26, 1924, he married Princess Nagako, daughter of Prince Kuni. On the death of his father, Dec. 25, 1926, he ascended the imperial throne, the ceremonies incident thereto being performed in 1928. In World War II his activities were veiled in mystery; he was reported, before the Pearl Harbor attack, to have asked Pres. Roosevelt to cooperate for peace. During the war he made hasty cabinet changes. At the conclusion he was retained on the throne but all his acts were subject to Gen. MacArthur's approval.

**Hirosaki**, town, Japan, on the island of



*Hippopotamus*

**Hiranyagarbha**, in the *Rigveda*, a deity who is said to have arisen in the beginning, the lord of all, who upholds heaven and earth, and sustains all life. According to Manu, he was Brahma, the first male, formed in a golden egg. After a year Brahma burst the egg, one part of which became the heavens, and the other the earth, while between them were the sky, the eight regions, and the eternal abode of waters.

**Hiring**, a term employed in a variety of related significations, including contracts of employment, leases, charter-parties, and the like. In its strict legal sense it denotes an agreement for the custody of a chattel either for the temporary use of the custodian, or for the expenditure of skill and care thereon by the latter, or for its transportation.

**Hirohito Michinomiya** (1901- ), the 124th emperor of Japan, son of Emperor Yoshihito, was born April 29. He was proclaimed Crown Prince in 1902 and in 1916 was appointed captain in the army and lieutenant in the navy, being promoted to be lieutenant colonel and commander in 1923 and colonel and captain in 1925. In 1921 he made a successful tour of Europe and in

Hondo. A special variety of lacquer ware is produced near it is Fukaura, noted for its manganese mines, p. 36,293.



*Hippocentaur*

**Hiroshige**, (Ando Tokutaro) (1797-1858), Japanese artist, was born in Tokyo. He became a pupil of Toyohiro, who was one of the first of the Japanese artists to depict phases of contemporary life, domestic incidents, and native scenery. Hiroshige took advantage of a popular interest in scenery to develop a new art of landscape representation. His first ex-

perment was to print his illustrations on separate sheets instead of binding them in books and secondly he began to use color in place of the familiar black and white. As a portraitist of misty ruins and snows Hiroshige has in the opinion of many never been surpassed. Among his best works are the *Edo Bayall 1*, 100 views vividly portraying the scenery of Edo (Tokyo), the 53 views of *Tokido*, 36 views of Mount Fuji and studies of flowers, birds, and fish.

**Hiroshima**, town Japan capital of the province of Hiroshima, at the mouth of Ota-gawa River. It is the center for lacquer, bronze, and other artistic work. Opposite Hiroshima is the rocky and richly-wooded island of Miyajima, or Itsukushima, a sacred island dedicated to the goddess Benten. In 1945 the city was heavily damaged by atomic bomb, p. 310,000.

**Hirsch, Emil Gustav** (1852-1913), American rabbi, was born in the grand duchy of Luxemburg. He studied at the University of Pennsylvania (1872) and in Berlin. He was a rabbi in Baltimore and in Louisville, and from 1890 was the head of the Synagogue congregation in Chicago. In 1892 he became professor of rabbinical literature at the University of Chicago. He was editor of *The Reform Advocate*, and did important work on the *Jewish Encyclopedia*.

**Hirsch, Maurice, Baron de** (1831-96), Jewish philanthropist was born in Munich. He devoted his first fortune, partly inherited and partly acquired by fortunate speculation, to schemes for the betterment of his race. To the *Alliance Israélite Universelle* he presented \$2,000,000, and endowed it with \$80,000 a year. For the benefit of persecuted Jews he founded in 1882 the (English) Jewish Colonization Association, with a capital of \$10,000,000, and in 1892 he gave it an additional \$15,000,000. The association has founded colonies of Russian Jews in Canada, South America, and Asiatic Turkey. He gave \$5,000,000 for the establishment of primary and technical schools in Galicia and Bukovina, and over \$500,000 to the London hospitals. In 1892 he gave \$2,500,000 for the improvement of Russian Jewish emigrants to the United States. The Baron de Hirsch Fund is an important feature of Jewish philanthropic work in the United States.

**Hirth, Friedrich** (1845-1927), German-American Chinese scholar, born in Gräfen-tonnau, Germany, in 1902 he became professor of Chinese at Columbia University. His books include *China and the Roman Orient* (1885),

*Ancient Porcelain* (1888) and *Text-Book of Documentary Chinese* (2 vols. 1885-89).

**Hispania**. See SPAIN. *Hispanic Society of America*, international organization for the furtherance of the study of the history, literature, and arts of the Spanish-speaking peoples. Founded in New York City in 1901, it has acquired a large and valuable library and collections of maps, printings, etc. Its membership is honorary, limited to 100 members.

**Hispaniola**. See HAITI.

**Histology**, the science which deals with the minute anatomy of organisms. Its development has in the first instance, been dependent upon the compound microscope, and can hardly be said to have been definitely founded until the formulation by Schleiden and Schwann of the cell theory in 1838-9. The histologist now recognizes four main kinds of tissues—epithelial, connective, muscular, nervous. No present-day worker, even in the instances thin of examining a tissue until it has gone through a long process of preparation, the most important part of which is the staining with coloring matter, mostly aniline dyes.

**Historical Association, American**. A society founded in 1883 and incorporated in 1899 for the promotion of historical science. Its publications include annual reports to Congress and monographs on historical topics. The association meets annually during Christmas week.

**History** originally denoted all required knowledge, next, a record of facts which had become known to the writer from his personal experience and observation, and finally, it was extended so as to include facts communicated to him by trustworthy and credible witnesses. As at present understood and applied, it has come to include, besides political events, the movements which belong to religion, law, literature, and economics. The earliest records, whether sacred or profane, are lists or tables giving the succession and genealogies of ruling dynasties. Subsequently they began to include dates of great military expeditions, treaties made with other nations, and payments of tribute. A further stage is reached when they are found incorporating annals of the court, or events relating to foreign policy. Associated, however, as such records mostly are, with a despotic or an aristocratic form of government, they contain little that serves to illustrate the inner life of the people. The books of Kings and of Samuel in the Old Testament, written in the 7th century B.C., and the books of Chronicles, compiled some

three centuries later, are the most notable examples of expansion from the meagre beginnings above described into something more nearly corresponding to what is now termed history. Another stage is reached when the record assumes the form of a continuous narrative, spontaneously undertaken by the author. Of such literature ancient Greece affords at once the earliest and the most noteworthy examples. Commencing with Hecataeus (B.C. 550-476) of Ionia and his fellow-logographers, we find in the 5th century (about half-way between the appearance of the books of Kings and those of Chronicles) the two contemporary writers, Herodotus of Halicarnassus and Thucydides of Athens, compiling their respective histories. But while Herodotus justifies in many ways his claim to be called 'the father of history,' his defective discrimination of the varied evidence from which his narrative is derived, his limited perception of the underlying causes of the events which he describes, and his too manifest desire not to allow even his own incredulity to interfere with his telling of his 'travelers' tales, compel us to assign him a place below that of his illustrious contemporary. In Thucydides, the absolute candor and impartiality of the writer, his deep insight into the significance of events and into the laws which operate on human motives, together with the rigorous abstention from any direct expression of his own political views, combine to form a standard of historical excellence which has rarely since been attained and never surpassed. The endeavor of Xenophon, in the first two books of the *Hellenica*, to continue the narrative was an effort beyond his powers. In Polybius (B.C. 204-122), commanding a historic retrospect unattainable by the foregoing writers, it first developed to shadow forth a philosophy of history. In the forces discernible as operating in the past, Polybius found an adequate explanation of the revolution in process in his own day.

The Latin literature, largely imitative of the Greek, offers no example of originality comparable with the foregoing, but Livy (B.C. 59-A.D. 17) and Tacitus (c. 54-117) are each exemplars of a high order of historical composition. Livy, like Thucydides, introduces long orations into his narrative, but he had no personal knowledge of practical affairs, and is wanting in breadth of view, occasionally betraying the influence of strong national partialities. Tacitus in his *Annals* too often deviates into what is biography rather than history. Lucian (A.D. 120-200) of Samosata has rarely been surpassed in subtle observation,

whether of social characteristics or of political affairs. Lucian commences by insisting on the fact that history is *not* 'one of the things which is easy to deal with.' He proceeds, accordingly, to enunciate certain canons, the observance of which he considers indispensable if the function of the historian is to be adequately discharged. 'To truth alone must he offer sacrifice, fearless, incorruptible, untrammelled, conceding nought either to hate or to friendship, a citizen of no city, recognizing allegiance to no ruler, and setting forth the results of his researches in a diction which the many may understand and the more educated approve.'

Writing at a time when the imperial power of Rome was at its culminating point, Lucian exulted in the empire's greatness, and his point of view is that of an enlightened and philosophic paganism, by which Christianity, as yet scarcely known by name, was very imperfectly apprehended. A century and a half later Christianity had become the religion of the state, and when, in 410, Rome fell before Alaric, there were those among the pagan writers who presumed to raise the cry that the woes of the Roman world were a heaven-sent visitation, and could only be interpreted as a manifestation of the displeasure of the gods at the repudiation of their worship for that of the God of the Christians. It was in answer to such allegations that Augustine of Hippo, between the years 413 and 426, compiled his treatise, *De Civitate Dei*. The influence exercised by Augustine's treatise on subsequent historical speculation can scarcely be overestimated, a result to which the abridgment drawn up by his devoted disciple Orosius largely conducted. The mental attitude of mediæval scholars and writers will indeed be but imperfectly understood if we fail to bear in mind that the abridgment by Orosius was the manual of profane history exclusively used by the teachers of the schools of Western Christendom throughout the middle ages. Estimated from this point of view, all pagan history came to be regarded as worthless. Even the history of Greece was well-nigh forgotten, along with the greater part of the Hellenic literature, while Roman history survived mainly through its association with the revived study of the Roman law. The influence exerted by Augustine in connection with historical teaching must therefore be regarded as reactionary.

As, however, the 15th century advanced, three great events combined gradually to bring about a marked advance in historic

theorization the revival of Greek learning brought back to Western Europe a fuller knowledge of the literature of antiquity, the invention of printing generated a rapid interchange of ideas which stimulated inquiry on every subject the discovery of the New World compelled the philosopher to take account of elements in humanity not included in the survey of any medieval thinker In Germany, the career and writings of Pufendorf (1670-1740) mark a notable innovation His *History of the Sense of Honour*, which gained for him the title of 'the German Xenophon,' is distinguished by its lucidity and impartiality and is referred to by Ranke as a good example of the great superiority perceptible in such narratives when grounded upon personal experience and observation The reverence had rendered immemorial service to the cause of historic truth by 'the more critical spirit which it engendered But the reformation in Germany, although originating in a like spirit, resulted in the appearance of two rival schools of thought, whose champions wielded the weapon of controversy with equal regard to candour and to the lessons of the past A voluminous literature resulted But if the spirit of sectarianism gave rise to grave perversions of history it at the same time imparted fresh stimulus to the study The Frenchman Jean Bodin (1530-96), the author of the famous *Republic*, published in 1566 his *Method of easily attaining to the Knowledge of History* That the first concern of the student of history is with mankind—with himself that is to say, and the world around him—that his knowledge of cosmography and of the influences of climate is essential to a right apprehension of universal history, and that an insight into religious truths and the operation of divine laws will be materially aided by a comparative study of religions, were novel and startling theories in the second half of the 16th century

De Thou or Thurnus (1553-1617), the eminent minister of Henry IV of France, in his *History of his Own Time*, exhibits a judicial impartiality which seems to fall but little short of the deal set forth by Bodin Clarendon's *History of the Rebellion* (final revision, 1667-74), although a work of signal merit, is essentially an apology in defence of the royalist party In France, the famous *Discours sur l'Histoire Universelle* (1681) of Bossuet exerted a reactionary influence By habitual reference to an overruling Power he evaded the labor and patient investigation requisite for the ascertainment of physical

laws After an interval of more than half a century appeared the epoch-making work of Montesquieu (1689-1755), the *Esprit des Loix* In arriving at the fundamental principles of his philosophy Montesquieu's researches and ponderings were long and arduous, for, as he himself tells us 'they were drawn, not from my prejudices but the nature of things' Starting with an enlarged conception of laws, he defines them as 'the necessary relations resulting from the nature of things—the chief determining causes of the course of history, compared with which legislation and all political crises, and powerful individualities can have but a secondary and altogether subordinate influence Every chapter bears the impress of a powerful and commanding originality

In the year 1725 appeared the *Scienza Nuova* of Vico the Italian philosopher, wherein he propounded afresh the Platonic theory of a Divine Idea which he held permeated all history and guided human destiny We have no evidence that Vico's speculations had been known to Turgot (1727-81) at the time (1750) when he delivered his two discourses at the Sorbonne, otherwise, the second discourse, entitled *Two Successive Ages of the Human Mind*, might well appear a development of the earlier writer's main theory To Turgot it seemed that progress was the essential, the distinguishing characteristic of man and that history was rightly its record Each epoch, he pointed out, is linked to those which precede or succeed it by a broad sequence of causes and effects, each generation bequeaths to the next an ever-increasing legacy of experience and knowledge, which preserved by multiplied signs of speech and writing, becomes the inalienable possession of the entire race Turgot appeared as the advocate of the church, and consequently found himself in direct opposition to the new philosophical movement represented by Diderot (1713-84) and the Encyclopedistes, powerfully aided by the literary activity of Voltaire and Rousseau Profoundly impressed by the degraded condition of the masses around them and the oppression which they held was the main cause of that degradation, this new school regarded with avowed hostility most of the existing institutions of their country, whether ecclesiastical or political Voltaire's contempt for everything medieval passed all reasonable bounds, while, on the other hand, he signally failed adequately to recognize the genius of Montesquieu He is entitled, however, to high praise as a historian, and his *History of*



*Charles XII*, and *Age of Louis XIV*, founded as they are on original sources, and evincing a genuine regard for accuracy and veracity, are excellent examples of historic composition.

In Germany, after the peace of Westphalia, the few scholars who devoted themselves to historical studies rarely did more than collect materials. Even the researches of Leibniz (1646-1716), in connection with his projected *History of the House of Brunswick*, appeared only in his *Scriptores Rerum Brunswicensium* (1707-11), and his *Annales Imperii Occidentis*, extending from 768 to 1005, remained unpublished, until given to the world by Pertz in 1843-6. A like genuine service was rendered by Christopher Keller to history when he prevailed upon scholars to renounce the theory of the 'four empires' for the division of the known historical eras into ancient, mediæval, and modern. It is not until the latter part of the 18th century that any material improvement is to be discerned in Germany, when it appears as mainly due to French influences working mediately through Switzerland. Isaac Iselin (1728-82), Wegelin (1721-91), A. L. von Schlozer (1735-1809), and Johannes von Müller (1752-1809), all approached different fields of philosophical inquiry with views that were to some extent original. The *Universal History* of Johannes von Müller (1752-1809) marks a new departure and takes rank as the first work of the kind, which, while exhibiting the several histories of the different nations in close connection, discriminates with accuracy the characteristic features of each. In 1784 Immanuel Kant published his *Ideas towards a Universal History from a Cosmopolitical Point of View*, a treatise of which Schiller's inaugural discourse delivered in 1789 (as professor of history at Jena) was little more than an echo. Kant maintains that the human will is never really free, and that even the most masterful spirits are but the unconscious instruments of an irresistible, all-pervading force working through all history. Man simply gives effect to that which nature designs. Kant held, however, that a progressive improvement in civil polity was to be discerned in Europe, and that Europe was destined to give laws to the rest of mankind, while the final cause of all history was to guide civilized communities to the development of a perfect political constitution.

From the time of Kant the whole conception of history becomes in Germany more complex and profound. Schelling (1775-1854) and F. Schlegel (1772-1829) each propounded a new theory, while the teaching of Hegel

(1770-1831) gave rise to the formation of an important school. Michelet, Quintet, Schweigger, Lassalle, Zeller, and Kuno Fischer all, in a greater or less degree, reflected the influence of that eminent philosopher in their researches. Side by side with this remarkable speculative movement there was also rising up in Germany a school with widely different characteristics. In Niebuhr (1776-1831) and Savigny (1779-1861) scholarship of the highest type was to be seen in combination with great original power, a strongly national spirit, and an extensive knowledge of men and affairs. By laborious study of long-disjointed fragments of evidence and a sagacious insight into the kernel of truth which lay shrouded in the 'myth,' Niebuhr, in his *History of the Roman People*, reconstructed the history of the Latin race, by similar, although less conjectural methods, Savigny compiled his *History of the Roman Law in the Middle Ages*, a work which may fairly be said to have initiated the historical study of law, while the labors of both these eminent scholars may be said to have been reflected in the researches of Wutz (1813-86), the founder of the school which established an organic conjunction between historical and legal studies. Scarcely less important were the services rendered by Stein (1757-1831), who first projected the invaluable series—the *Monumenta Germaniæ Historica*—associated with the name of Pertz (1795-1876). In 1824 Leopold von Ranke (1795-1886) published his *History of the Romance and German Races from 1494 to 1514*, with a masterly criticism of the sources to which he had been mainly indebted. Towards the conclusion he pointed out certain improvements in historical investigation which he deemed essential to a genuinely scientific method. In the preface to his *History of Germany in the Period of the Reformation* (1839-40), he expressed his conviction that, in no long time, the duly-trained historian would cease to rely on the statements of even contemporary writers, unless derived from a first-hand knowledge of the facts, and would, as far as possible, ground his narrative solely on original documents. Under the depressing influences of the Hanoverian rule, history declined greatly in England. The reception accorded in France to Voltaire's famous *Essai sur les Mœurs et l'Esprit des Nations* (1755) stands in marked contrast to that vouchsafed to the two first volumes of Hume's *History of England*, published at the same time. Even the undeniable merits of Robertson's *History of Charles V* (1769) bring into stronger relief

the defective knowledge of earlier times betrayed in his introduction. Gibbon's *Decline and Fall of the Roman Empire* (1766-88), justly characterized as 'the greatest monument of historical research united to imaginative art of any age in any language' was written for the most part, in a foreign land and derived, on the author's own showing but little inspiration from his native country. But with the commencement of the 19th century the influence of German scholarship brought about a decisive change. Niebuhr's *History of Rome* (1812-32) translated by Thirlall and Julius Charles Hare found, it is said, more readers in England than did the original in Germany. In 1838-43 appeared *The Early History of Rome*, by Thomas Arnold (1795-1842), a work largely founded on Niebuhr's researches. Sir G. C. Lewis (1806-63), in his *Inquiry into the Credibility of the Early Roman History* (1855) challenged with great acumen some of Niebuhr's most important conclusions. Between 1835 and 1850 appeared the rival histories of Greece by Grote (1791-1871) and Thirlall (1797-1875). Each author had commenced his researches unknown to the other although they were personal friends.

The speculative tendencies of French philosophy found notable expression in the writings of Charles Comte (1780-1837), who, in his *Traité de Philosophie* reopened the question of the influence of physical laws upon civilization. The better-known August Comte (1798-1857) compiled his *Cours de Philosophie Positive*, and founded a school which, in the course of another generation was represented by an extensive literature. The movement extended to England, and Buckle (1821-62), in his *History of Civilization*, reviewed the chief theories of his predecessors and propounded his own conclusions with unprecedented wealth of illustration and remarkable ability. The activity of the more strictly historical school in France now began to command the attention of all learned Europe, and J. S. Mill (writing in 1841) affirms that their writings far surpassed those of Germany in importance. The works of Sismondi (1773-1842), Thierry (1795-1856), Mignet (1796-1884), Thiers (1797-1877), and Michelet (1798-1874) exhibit characteristic merits, but all, with the exception of Mignet, betray the influence of strong partialities very imperfectly disguised. The writings of Guizot (1787-1874) and De Barante (1782-1866) present, however, a more distinctly scientific spirit. Guizot, who edited Gibbon, and first drew attention to the invaluable labors of Savigny,

defined anew the true aims of the historian. It was his view that faithful research with its results duly assimilated, ought to enable the writer to supply such a portraiture of the past that it should be, both to him and to his reader, a veritable present. De Barante, on the other hand in his *Histoire des Ducs de Bourgogne*, preferred, wherever it was possible, to leave his early chroniclers to tell the story in their own language. But their quaint and obsolete diction repelled the ordinary reader and it was reserved for Thierry and Michelet, two young and enthusiastic scholars, combining a special faculty of graphic description with the results of conscientious study, to advance the art of historical narration a further stage.

During the first quarter of a century the path marked out by Ranke appears to have attracted the best historic talent, the facilities for its pursuit having also largely multiplied. Free access has been afforded to the national archives of all the chief countries of Europe, their contents have been carefully catalogued, the more important manuscripts in both public and private libraries have been printed and published, a hitherto innumerable ancient inscriptions have been brought to light and deciphered. Labors of scholars such as Pertz, Wutz, Mommsen, Curtius, Siebel, and Lichner in Germany, Stubbs, Freeman and S. R. Gardiner in England, G. Monod, Fauriol, and Luchaire in France, have borne fruit in works which, for the most part are not likely soon to be superseded. Concurrently with this improved standard of performance, the conviction has steadily been gaining ground that, if history is to be regarded as a serious study, no preconceived theory, no local or national sympathies, no political bias must be permitted to give it bias or color. The primary and paramount consideration must be to ascertain accurately each fact, as far as the known evidence permits, the ultimate aim must be the scientific synthesis of the whole body of such facts. On the importance of technical knowledge, as enabling the possessor to discriminate between genuine and spurious documents, and to detect interpolations, a good example is afforded in the work of A. Aulard, *Histoire Politique de la Révolution Française* (1901), a production which may be said to illustrate the dictum that 'the historian is at his best when he himself does not appear', and in the *Cambridge Modern History* the same principle, as inculcated by the late Lord Acton, is assumed to underlie the treatment adopted by the respective contributors.

The earliest historical writing in America consisted of semi-biographical accounts of discoveries, explorations, and settlements, such as John Smith's (1580-1631) *True Relation of Virginia* (1608), William Bradford's (1588-1657) *History of Plymouth Plantation* (1630-1650, published 1856), and John Winthrop's (1588-1649) *History of New England* (1630-1649, published 1790, 1825-1826). During the latter half of the 18th century the literary tone was decidedly polemical. Whig and Tory pamphleteers regarded history as a storehouse from which arguments might be drawn to sustain their political theories. The only work of permanent value was a *History of Massachusetts Bay* (1764, 1828), by Thomas Hutchinson (1711-1780), the last loyalist governor of that province. Although aptly characterized by Hawthorne's remark that 'a duller book never came from the brain of mortal,' in accuracy and freedom from prejudice it approaches the modern ideals of historiography. If history be considered primarily as a branch of literature, the period from the Revolution to the close of the Civil War, 1783-1865, was the classical age in the United States. Washington Irving (1783-1859), W. H. Prescott (1796-1859), and J. L. Motley (1814-1877) sought in Spain, Holland, and Spanish America the picturesque traditions which their own country did not afford. They were not profoundly philosophical, they were not gifted with keenness of critical insight, but there is a vigor and a seductive charm about their work which still commands our interest and our admiration. In vivid and romantic delineation Prescott's *Conquest of Mexico* (1843), *Conquest of Peru* (1847), and *History of the Reign of Philip the Second* (1855-1858) easily take first rank, but neither he nor Motley could make use of that good humored whimsical satire which has given Irving's *History of New York by Diedrick Knickerbocker* (1809), so wide a reputation. Another group of students during this period included George Bancroft (1800-1891), Jared Sparks (1789-1866), J. G. Palfrey (1796-1881), and Richard Hildreth (1807-1865), all New Englanders. They addressed themselves entirely to American affairs, considering them from the political point of view. Bancroft's stupendous *History of the United States* (10 vols., 1834-1874, 6 vol. ed. revised, 1883-1885) was the first considerable work in America written according to the modern canons of historical investigation. Sparks's *Life of Washington* (1834) was of the Carlyle hero-worship type, and his edition of the *Writings of Washington* (1834-

1837) was the subject of considerable adverse criticism. Palfrey represents the New England filio-pietistic school, which defends the entire Puritan program of that section, ecclesiastical as well as political. Hildreth's *History of the United States [to 1821]* (6 vols., 1840-1852) is dry, poorly arranged, and ultra-Federalist in tone.

Although Bancroft, Motley, and Tichnor (1791-1871) studied in Germany between 1813 and 1833, and other Americans followed their example the next three decades, German historical methods exercised comparatively little influence until after the close of the Civil War. After that time, the seminar system was adopted at Harvard, Johns Hopkins, Columbia, Cornell, Chicago, Wisconsin, and other universities. Henry Adams (1838-1918), at Harvard and Herbert B. Adams (1850-1901) at Johns Hopkins were pioneers in the field. H. E. von Holst (1841-1904) encouraged research in the northwest, and Justin Winsor (1831-97) was a force for historical learning at Harvard. The leading writers of the period were Henry C. Lea (1825-1909), author of works dealing with phases of the medieval church, and Francis Parkman (1823-93), whose *France and England in America* (12 vols., 1851-92) combine the literary talent of a Prescott with the highest critical ability. John Fiske (1842-1901) was without a peer in America as a philosophical historian, but his conclusions are sometimes based on inadequate data. Medieval history is represented by Charles H. Haskins (1870-1937), Charles Gross (1857-1909), and James H. Robinson (1863-1936), the French Revolution by H. Morse Stephens (1857-1919), naval history by Alfred T. Mahan (1840-1914), American political history by J. F. Rhodes (1848-1927), James Schouler (1839-1920), Henry Adams, von Holst, Albert Bushnell Hart (1854-1943), and Woodrow Wilson (1856-1924), social and economic history by J. B. McMaster (1852-1932) and Frederick J. Turner (1861-1932). Of other authorities in special fields, mention should be made of Herbert L. Osgood (1855-1918) and Edward Channing (1856-1931) for the colonies, J. F. Jameson (1859-1937) for the confederation and constitution, Hubert H. Bancroft (1832-1918) for Spanish-America, Edward G. Bourne (1860-1908) for historical criticism, and Theodore Roosevelt (1858-1919) for his history of the naval war of 1812 and his *Winning of the West*. Other historians worthy of mention are John McPherson, Frank Simonds, and Poultney Bigelow. The World Wars produced many histories.

**Hitchcock, Alfred Joseph** (1899- ), British motion-picture producer, came to U S in 1938, produced *The Girl Was Young*, *The Lady Vanishes*, *Rebecca*, and *Suspicion*, *Spellbound* (1944)

**Hitchcock, Charles Henry** (1836-1919), American geologist, was born in Amherst, Mass. He was State geologist of Maine in 1861-62, and of New Hampshire in 1868-78. He was in charge of the expedition on Mt. Washington in the winter of 1870-71, and issued daily weather bulletins from that point, the first service of the kind in the United States.

**Hitchcock, Edward** (1793-1864), American geologist, was professor of chemistry and natural history at Amherst from 1825 to 1845, when he became president of the college, taking the chairs of natural theology and geology. In 1854 he resigned the presidency, but remained on the faculty for the rest of his life.

**Hitchcock, Ethan Allen** (1835-1909), American public official, U S Minister to Russia, 1897, and Secretary of the Interior, 1898-1907.

**Hitchcock, Frank Harris** (1869-1935), American lawyer and public official, was born in Amherst, O. He was for a time biologist in the U S Department of Agriculture, and later first assistant Postmaster-General (1905-8), and Postmaster-General under President Taft (1909-13). He established postal savings banks and the parcel post.

**Hitchcock, Gilbert Monell** (1859-1934), American legislator and publisher, was born in Omaha, Neb. He practiced law in Omaha until 1885, established the Omaha *World-Herald*. He was a member of Congress during 1903-5 and 1907-11, and U S Senator, 1911-23. In 1918 he became chairman of the Senate Committee on Foreign Relations.

**Hitler, Adolf** (1889-1945), Austro-German political leader, born in Braunau, Austria near the Bohemian frontier, where his father was a customs official. Before completing a public school education he migrated to Vienna, where for five years he lived by manual labor. To escape military service he went to Munich in 1912 and took interest in politics. When the war came in 1914 he enlisted in the German army, thus losing his nationality. He distinguished himself as a daring dispatch runner, was wounded, gassed and decorated, but rose to no official rank. With the revolution in 1918 Germany became a republic much to Hitler's disgust. He preached anti-republicanism in the beer cellars of Munich and by 1921 was the accepted leader of that

movement. Allied with General von Ludendorff and some military support, the two attempted a coup (the 'Beer Putsch') in Munich on Nov. 8, 1923. The plot failed and Hitler received five years' imprisonment, but was liberated a year later. In 1930 he became leader of the National Socialist Workers' Party (the 'Nazis'), modeled on Fascist principles. By successive elections Hitler's strength rose until in 1932 he was taken into ministerial confidence. He could not be ignored nor suppressed, and attained his goal when he was appointed Chancellor on January 30, 1933. On the death of President von Hindenburg, he assumed in August, 1934, that office, styling himself 'Reichsfuehrer', or Realm Leader.

Hitler shocked the world on June 30, 1934 by a merciless 'blood purge' of his party in which it was admitted 77 persons were executed. Enemies of the Nazi regime said hundreds were slain.

In 1935, he announced the return of conscription to Germany. Later came admission that the country had resumed rearmament. These acts were forbidden by the Versailles Treaty.

Hitler cultivated friendship with Mussolini and the Rome-Berlin Axis became a reality in 1937. Jews were persecuted, driven from Germany and their properties confiscated. In March 1938, Hitler seized Austria, making it part of his domain. German residents of Czechoslovakia's border lands were stirred into revolt. France and Britain unready for war sought to appease Hitler for Europe's peace at the Munich conference, September 1938, by having Czechoslovakia cede all her Sudetenlands to Germany. This was done and it so demoralized Czechoslovakia that Hitler was enabled to annex the bulk of that country unresisted in March 1939, and to terminate its national existence. He permitted Hungary to take the small remainder. Hitler's hand was strengthened when the Spanish Civil War ended March 1939, with complete victory for the rebel Franco who had been actively supported by Hitler and Mussolini. Some month later Hitler grabbed Memel from little Lithuania. Then appeared indications that Hitler's nerve was preparing the German residents of Danzig to further his plans for control of that city and the Polish corridor. Meanwhile France and Britain having progressed with war preparations and having learned the futility of attempting to appease Hitler, assured Poland of support with force if she would

fight to preserve her rights Poland accepted the assurance and declared she would fight. On Sept 1, 1939 Hitler ordered his armies to attack Poland. Three days later England and France declared war on Germany. In less than a month the Nazi army had completely conquered the Polish forces and that country was partitioned, 2/5 to Germany and 3/5 to Russia. Hitler then sought to



Keystone View Co

Adolf Hitler

make peace with the Allies on the condition that they recognize his latest conquest. England and France refused. Nov, 1939, Hitler missed by only 10 minutes being killed by a time bomb which exploded in a Munich beer-garden. Before starting his Polish campaign Hitler had signed a non-aggression and trade pact with Russia. By the fall of 1941 Hitler by force of arms or diplomacy was the master of the European continent except for Switzerland, Spain, Sweden, and Portugal, but he was still at war with England and Russia. Dec 11, 1941 Hitler declared war on the U S. Dec 22 he became commander of the German armies. On March 24, 1933, Hitler had been granted powers as German dictator for ten years. On May 15, 1943, he signed a decree continuing his dictatorship for an indefinite period. In 1942 he assumed army leadership, his campaign in Russia was halted at Stalingrad and the African Campaign failed. In 1943 his army in Russia was in retreat, his ally Mussolini was overthrown and Italy surrendered to the Allies. In July 1944 Hitler escaped when a bomb was exploded in his headquarters, probably plotted by army officers. His fate was shrouded in mystery, Himmler reported his death on

Apr 28, 1945, later he was reported officially dead.

**Hittites**, a people of obscure origin and racial connections, first appearing in history as invaders of Babylon (1754 B C). From the presence of mountain deities among their gods and from certain characteristics of dress, it has been inferred that their early home was in the mountains, but whether they were indigenous to Asia Minor or migrated from the east is unknown. References to the Hittites are frequently found in the Old Testament.

The monuments of Egypt and Assyria have thrown a good deal of light upon these Hittites of the north. They reached the height of their power at about the beginning of the 14th century B C. As the Egyptian power decayed, they made themselves masters of Syria, and established a southern capital at Kadesh.

The 19th Egyptian dynasty endeavored to restore the Egyptian empire in Asia. But the way was blocked by the Hittites. The Hittite empire soon gave way, however, to a confederation of independent kingdoms, and the



Hitler in Action

Armenian Semites gradually recovered the cities and territories of which they had been dispossessed. The capture of Carchemish by the Assyrian king Sargon in 717 B C finally put an end to the Hittite domination in Syria, which had lasted for more than seven hundred years.

**Hive, Bee** See BEES

**Hives** (*urticaria*), a skin disease characterized by evanescent rounded welts attended by intense itching

**Hoang-ho** See YELLOW RIVER

**Hoar, George Frisbie** (1826-1904), American legislator, son of Samuel Hoar (1778-1856), was born in Concord, Mass. He was a member of the State House of Representatives in 1852, and of the State Senate in 1857, and served as Republican Representative from Massachusetts in the 41st, 42d, 43d and 44th Congresses. He was elected to the U. S. Senate, as a Republican, to succeed George S.



*George Frisbie Hoar*

Boutwell, took his seat in 1877 and was re-elected in 1883, 1889, 1895 and 1901. Throughout his career Senator Hoar was a conspicuous figure in Republican political circles. He was a man of unusual scholarly attainments, both in the classics and the sciences, as was indicated by his active interest in many scientific and historical associations.

**Hoar Frost**, or **Rime**, the frozen dew particles or molecules of water from the air, which, when the temperature falls below freezing, are deposited upon grass, twigs, herbage, and other objects. It is also formed by the congelation of moisture arising from the ground, collecting upon bits of wood and other objects which have lain under the snow. Still another type is that which is seen in scattered clumps on frozen ponds and lakes. See **Dew**, **Frost**.

**Hoarseness**, or unnatural roughness of the voice, is a leading symptom of diseases which affect the vocal cords. Any condition, such as laryngitis, which causes swelling and thickening of the cords, produces an alteration in the timbre of the voice. Thus, a common cold often causes a temporary vocal

harshness, which disappears as the catarrh subsides. See **LARYNX**.

**Hoatzin**, (*Opisthocomus cristatus*), a curious South American bird allied to the game birds but with various anomalous characters. It is pheasant-like, with a long, thin body, a strong, serrated beak, an erectile crest on



*Hoatzin*

the head, and long claws. The breast bone is curiously modified, the keel being much reduced. Over this flattened region is a thickened patch of skin, on which the bird rests. The crop is enormous, and the animal consumes large quantities of leaves and fruit.

**Hobart**, capital and largest city of Tasmania, Australia, is picturesquely situated in the southern part of the island, on the estuary of the river Derwent, at the foot of Mount Wellington. It has an exceptionally good climate and an excellent harbor. Hobart is a fine modern city, with broad streets, drives, parks, a good tramway system, and many handsome buildings. Hobart was founded in 1803, p. 56, 193.

**Hobart, Garret Augustus** (1844-99), American lawyer and legislator, vice-president of the United States in President McKinley's first administration. He was graduated from Rutgers College (1863), was admitted to the New Jersey bar in 1869, practised law in Paterson, N. J., was city counsel there (1871), and served in the State Assembly (1873-78) and the State Senate (1879-85). He was a personal friend and influential advisor of President McKinley, and as vice-president was an official of much consequence in the administration. He died Nov. 21, 1899, before his term of office expired.

**Hobart, John Henry** (1775-1830), American Protestant-Episcopal bishop. In 1811 he was elected assistant bishop of New York, in

1812 assistant rector, and in 1816 rector of Trinity and bishop of the diocese. In this capacity he led in the controversy growing out of the distrust of the Episcopal Church because of its connection with the Church of England, and did much to dispel that prejudice. He was one of the founders of the N. Y. General Theological Seminary.

**Hobart College.** An institution of higher learning situated in Geneva, N. Y. It is the development of a theological school founded by Trinity Church Corporation, New York City, in 1812. At the instance of Bishop Hobart, in 1821 the school was transferred to Geneva, N. Y., and in 1860 the name was changed to Hobart College.

**Hobbes, Thomas (1588-1679),** English philosopher, was born in Malmesbury, Wiltshire, and is often referred to as the philosopher of Malmesbury. He was graduated from Oxford and in 1640 went to France, where he met the philosophers and scientists who represented the most advanced ideas in scientific method. In 1651 he returned to London. As a philosopher, Hobbes is generally regarded as the father of English materialism. Locke was largely influenced by him in the development of the 'sensation' theory of knowledge. It is as a political philosopher, however, that his fame is greatest. His works in this field include *De Gibe* (1642), *De Corpore Politico* (1650), and *Leviathan* (1651).



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Girls Playing Field Hockey

**Hobbema, Meindert (1638-1709),** Dutch painter, was born probably in Amsterdam. Little is known of his life, save that he lived and died poor, was married in 1668, and the same year was appointed wine gauger in Amsterdam. His pictures did not attract attention till after his death, but he is now placed, with Cuyp and Ruysdael (whose pupil and friend he was), at the head of the Dutch School of landscape painters. With less poetic feeling than Ruysdael, Hobbema surpasses him in atmospheric effect, tone, and brilliancy of color, which qualities give beauty to his prosaic scenes. He is primarily a painter of sunlight effects. Among his works are *The Avenue of Middelhaarns*, *Showery Weather*, *Watermills and Bleacheries*, *Ruins of Brederode Castle*.

The object of his *Leviathan* is to determine the origin of sovereignty. Thus he finds in an original social compact, whereby man, weary of the insecurity of the state of nature, which is a state of war, agrees to submit to the authority of an individual or of individuals strong enough to repress anarchy. Consult *Life* by Croom Robertson, the volume in English Men of Letters series by Leslie Stephen, and A. E. Taylor's *Thomas Hobbes*.

**Hobblebush**, the common name given to a species of *Viburnum* (*V. alnifolium*) found in North America from New Brunswick and Michigan to North Carolina. It is a low shrub with wide spreading, often procumbent branches.

**Hoboken**, city, New Jersey, Hudson co., on the Hudson River, connected with New

York City by the Hudson and Manhattan Tunnel system. The piers of many transatlantic shipping lines are located here, and it was the chief port of embarkation for the American Expeditionary Forces in the Great War, 75 per cent of the troops leaving through the port. Educational institutions include the Stevens Institute of Technology, the Academy of the Sacred Heart, and the Hoboken Academy.

Hoboken stands on part of the site of patroonship of Michael Pauw (granted 1630). The Indians carved pipes here, hence the name 'Hoboken Hacking,' the country of the pipe. In 1804 John Stevens bought the land and established a settlement, which became a town in 1849 and a city in 1855, p 50,115.

**Hobson, Richmond Pearson** (1870-1937), former U S naval officer, born in Greensboro, Ala., and was educated at the U S Naval Academy (1889) and in Paris scientific schools. A lieutenant of the flagship *New York*, he won fame in the Spanish-American war by sinking the collier *Merrimac* at the entrance to Santiago harbor (June 3, 1898) under the Spanish guns, for the purpose of blocking the exit of the Spanish fleet. From 1906 to 1915 he was a member of Congress from Alabama.

**Hobson, Thomas** (?1544-1631), the Cambridge carrier, immortalized by Milton in two humorous epitaphs. His insistence on each horse in his stable being taken out in turn gave rise to the expression 'Hobson's choice'—'this or none.'

**Hock**, a name given to any light white German wine. The majority of hocks are dry, but some are sweet, and even luscious.

**Hockey**, an outdoor game played between two teams of eleven players, who, armed with sticks curved at the end, seek to put a ball through their opponents' goal. Its name is said to be derived from the French *hoquet*, meaning shepherd's crook. The peoples of Northern Europe and Asia were among the earliest exponents, and there is evidence that the ancient Romans played a game strongly resembling hockey. It is played in India, Canada, and in most parts of Europe, and since the beginning of the present century has become increasingly popular in the United States. In 1901 it was given a permanent place in the athletics of American women's colleges.

The regulation hockey field is 100 yards long by 50 yards wide. Across the field, 50 yards from each end line, is a line called the center line with a cross in its center. Each

half is again divided by a 25-yard line, and a 5-yard line is drawn parallel to each side line. Two goal posts, uprights 7 ft high with a horizontal bar between them, are placed 4 yards apart in the center of each end line. In front of each goal, 15 yards from and parallel to it, is drawn a line 4 yards long, the ends of which are carried in a curve forming a quarter circle, with the goal posts as center, until they reach the goal line at a point 15 yards from the nearest goal post. The space thus formed is known as the striking circle. Nets are usually affixed to the back of the goal posts. The sticks, made of ash or hickory, are about 3 ft 2 inches long and weigh from 18 to 22 ounces. The ball is a regulation leather cricket ball painted white.

The team is usually composed of five forwards, three half-backs, two full-backs and one goalkeeper, and the game commonly consists of two 35-minute halves. The referee places the ball in the center of the field and the game begins by the two center forwards *bullying* the ball, each tapping the ground with his stick on his own side of the center line and then his opponent's stick over the ball three times. After this has been done, either center may strike the ball. The ball may be moved only by means of the stick. It may be stopped or caught, but must immediately be dropped to the ground. A goal is made when the ball is knocked between the goal posts entirely over the goal line and under the bar.

*Ice hockey* is a natural development of field hockey. It was introduced into America about 1880, when some of the Canadian colleges took it up as a winter sport. In 1887 the Amateur Hockey Association of Canada was formed, and the game was placed on a firm footing. During the winter of 1894-5 several college players from the United States visited Canada, played with clubs there, and soon after their return formed clubs in their own country, the St. Nicholas Club being the first. Later the colleges took up the sport, and it is now one of the popular winter games.

For playing ice hockey a clear sheet of ice not less than 112 by 58 feet is required. A boundary of boards, from 6 to 36 inches high—preferably the latter—is necessary. Goals consist of netting supported by posts four ft high and six ft apart. They are placed at least ten feet from the edge of the ice in the center of each end of the rink. The implements comprise a vulcanized rubber disk one inch thick and three inches in diameter, called a 'puck,' and sticks, varying in length



according to their use by forwards or defence players, terminating in a blade set at an angle of about 45 degrees with the haft. Their average length is four feet, and the blade may not be more than three inches wide. The object of the game is to push the puck between the opponent's goal posts, thus scoring a goal. The game consists of halves of twenty minutes each with an intermission of ten minutes. In case of a tie a third period is played until a goal has been scored. The puck is not struck with the stick but is advanced by pushing and by lifting with the blade. The teams are made up of seven players, the de-

His important works are *The Meaning of God in Human Experience* (1912), *Man and the State* (1926), *The Self, its Body and Freedom* (1928), *Spirit of World Politics* (1932), *Living Religions and a World Faith* (1940).

Hodge, Frederick Webb, (1864- ), American ethnologist, was born in Plymouth, England. He was connected with the U S Geological Survey in 1884-6, was secretary of the Hemenway Archaeological Expedition which explored the ancient ruins of Arizona and New Mexico in 1886-9, and in 1889 became associated with the Bureau of American Ethnology, for which he prepared a



Ice Hockey at Montreal, Canada

fence consisting of goal tender, point, and cover-point, and the forwards being right end, right center, left center, and left end. Play is begun by placing the puck between the sticks of two opponents in the centre of the rink. Penalties for offside play and other infractions of the rules may be given by the referee, who, with two umpires, constitute the officials.

Hocking, William Ernest (1873- ), American philosopher, born at Cleveland, Ohio, and educated at Harvard University. From 1906 he taught at California, then Yale, then Harvard Universities, becoming Alford professor at Harvard in 1920. He was chairman of the laymen's commission for the survey of foreign missions, of which the report, *Rethinking Missions*, was published in 1932.

*Handbook of the American Indians* (1907-10). In 1897 he explored the 'Enchanted Mesa' in New Mexico, and in 1901 became an officer of the Smithsonian Institution, being transferred in 1905 to the Bureau of American Ethnology. In 1918 he became associated with the Heye Foundation, Museum of the American Indian, New York City. He published *The First Discovered City of Cibola* (1895), and many contributions to the *American Anthropologist*.

Hodgins, John George (1821-1912), Canadian educator, deputy superintendent of education from 1855 to 1876 and provincial deputy minister of education from 1876 to 1890. He exerted an exceedingly important influence in educational matters in Ontario, and wrote a valuable *Documentary History*

of *Education in Upper Canada* in 28 volumes (1910-13), and other works. He was for many years editor of the *Upper Canada Journal of Education*.

**Hoe, Richard March** (1812-86), American inventor, was born in New York. He worked with his father Robert (1784-1833), a skilful printer and proprietor of a successful business, and eventually, with his brothers, took over the control of the firm. In 1846 he invented a printing machine of the modern rotary type, known as 'Hoe's lightning press,' which was afterwards rendered capable of printing simultaneously on both sides of a long sheet of paper. See **PRINTING**.

**Hoe, Robert** (1839-1909), American inventor, grandson of Robert Hoe (1784-1833), was born in New York City. He was educated in the United States and in Europe, entered the Hoe printing press factory, and eventually became the head of the firm. He not only made improvements upon the Hoe press of 1846, but invented a rotary press, and a multicolor press. He was one of the organizers and the first president of the Grolier Club, devoted to the art of book making, and was the author of *A Short History of the Printing Press* (1902).

**Hofer, Andreas** (1767-1810), Tyrolean patriot. On the transference (1805) of the Tyrol from Austria to Bavaria by Napoleon, headed a revolt, and drove the Bavarians from the country. Again, in 1809, after twice defeating the Bavarians and French and twice occupying Innsbruck, he won a third victory at Berg Isel. Eventually he was betrayed to the French in 1810, and carried to Mantua, where he was shot by order of Napoleon.

**Hoffman, Charles Fenno** (1806-84), American poet and author, was born in New York City. He was educated at Columbia College and was admitted to the bar in 1827. Three years afterward he abandoned the practice of law, and thereafter devoted himself to editorial work and writing. He founded the *Knickerbocker Magazine* in 1833, and later the *American Monthly Magazine*, which he edited for several years.

**Hoffmann, August Heinrich**, commonly called **Hoffmann von Fallersleben** (1798-1874), German poet and philologist. His songs are characterized by great simplicity, tenderness, and vigor. His publications include *Alemannische Lieder* (1827), *Jägerlieder* (1828), *Rheinleben* (1831), a selection of *Gedichte* (9th ed 1887), and many children's and folk songs. A complete collection of his

writings — *Gesammelte Werke*—appeared in 1890-3.

**Hoffman, Ernst Theodor Wilhelm** (1776-1822), German writer and musical composer, was born in Königsberg. He was trained to the law, but in 1806 had his career cut short, at Warsaw, by the invasion of the French. In music he is remembered for his opera *Undine* (1816).

**Hoffman, Malvina** (1887- ), American sculptor, who studied with Rodin. Her works include portraits of John Muir and Paderewski, *The Sacrifice*, a Harvard war memorial, and *Bacchanale russe*.

**Hofmann, August Wilhelm von** (1818-92), German chemist. He became assistant to Liebig, and in 1845 was appointed professor at the newly established Royal College of Chemistry, London. He returned to Germany, to become professor at Bonn (1864) and Berlin (1865). At Berlin his researches were especially fruitful in the domain of organic chemistry. Those on coal-tar products led to the artificial preparation of numerous coloring matters from aniline, and practically revolutionized the art of dyeing.

**Hofmann, Josef** (1877- ), Polish pianist, was born in Cracow. He made his debut when only six years old and some years later studied under Rubinstein. He visited the United States in 1887, returned to Berlin for further training, and appeared in concert tours in Germany, Austria, England, and America, where he spent much of his time from 1898 on. Besides being one of the most popular popular modern pianists, he has produced compositions for the piano (some appearing under the name of Dvorsky) and published books on piano playing.

**Hogarth, William** (1697-1764), founder of the British school of painting, born in London, set up business for himself (1718), and turned his attention to engraving on copper. From the outset he relied on his own powers of observation, and sought his models when roaming about the streets. His work was thus the pioneer effort of a new epoch. He first became known as an engraver by his plates for Butler's *Hudibras* (1726). His culminating work, in 1745, was the six extraordinarily inventive pictures entitled *Marriage à la Mode*, now in the National Gallery, London. In 1745 he painted his famous portrait of himself (National Gallery), with the serpentine line on a palette in a corner, and the words, 'The line of beauty and grace.' Whereupon so eager a discussion arose that he wrote

*The Analysis of Beauty* (1753), to explain, and to endeavor to fix a standard of beauty. See *William Hogarth*, by Austin Dobson (1879), *Hogarth Illustrated*, by Samuel Ireland (3 vols 1891-8)

**Hogg, James** (1770-1835), 'the Ettrick Shepherd,' Scottish poet, song-writer, and essayist, was born at Ettrickhall, in the valley of the Ettrick, Selkirkshire. From about the age of six he worked for his living as a herd. He strove to imitate the measure of Burns, and the effort made him a poet. In 1802 he assisted Scott in his search for materials for his *Minstrelsy of the Scottish Border*. He is regarded as the legitimate successor of Burns. *The Witch of Fife*, *The Skelark*, *When the Kye come Home*, and, above all, *Kilmenny*, show his genius at its best. His best prose work, *The Browne of Bodsbeck* (1818), a Covenanting tale, prints the life of the humble poor in a manner not surpassed even by Scott. *The Shepherd's Calendar*, *The Three Perils of Man*, and *The Three Perils of Woman* reveal a rich vein of Border romance and sentiment. See *Hogg*, by Sir George Douglas (Famous Scots Series, 1889)

**Hognose or Puffing Adder**, one of two species of colubrine snakes of the North American genus *Heterodon*, reaching a length of about two feet, and gray or blackish with irregular whitish transverse markings. This snake, though perfectly harmless, flattens its head, hisses and mimics so well the formidable appearance of an adder, especially the copperhead, that it is often mistaken for one, and is popularly regarded as venomous.

**Hohenheim**, vil, Wurtemberg, Germany, is the seat of one of the best-equipped agricultural colleges in the world. Under the Nazi regime agricultural colleges have become extremely important.

**Hohenlinden**, vil, Upper Bavaria, the scene of the victory of the French, under Moreau, over the Austrians, under Archduke John, on Dec 3, 1800. The poet Campbell has commemorated the battle in his lyric *Hohenlinden*.

**Hohenlohe - Schillingsfurst, Chlodwig Karl Viktor, Prince of** (1819-1901), German statesman. After Sadowa he was appointed (1866) chief minister of Bavaria, and tried to bring about the union of Southern and Northern Germany. He advocated the alliance of Bavaria with Prussia in the Franco-German war. In 1874 he was sent as German ambassador to Paris, where he remained till 1885. As governor of Alsace-Lorraine (1885-94) he pursued a conciliatory policy. In 1894

he became imperial chancellor, but resigned in 1900.

**Hohenstaufen**, name of a German imperial dynasty from 1138 to 1254. The first known member is Frederick of Buren in Swabia. His son Frederick was made Duke of Swabia for his fidelity to the Emperor Henry IV. His grandson was crowned king of Italy (1128), and on the death of Lothar was elected emperor as Conrad III, handing on the empire to his nephew, Frederick Barbarossa. The next emperors of this family were Henry IV, Philip, and Frederick II, whose son, Conrad IV, was the last emperor of the house of Hohenstaufen, which practically became extinct. The history of the family is one long contest with the Guelfs and the papacy, ending in the triumph of the latter.

**Hohenzollern**, two small principalities, Hohenzollern-Hechingen and Hohenzollern-Sigmaringen, in the S of Germany, between the Neckar and the Lake of Constance. The castle of Hohenzollern stands on a steep eminence near Hechingen.

**Hohenzollern**, German imperial dynasty, takes its name from the castle of Hohenzollern in Swabia, and traces its origin to Tassilon, who lived under Charlemagne. A younger son of the house, Conrad, sought service under Frederick Barbarossa, becoming burgrave or imperial steward of Nuremberg about 1170. In 1226 the family split in the Franconian and Swabian branches. From 1420 the history of the family begins to be closely allied with the early history of Prussia, as the history of the Franconian branch had been bound up with the Holy Roman Empire.

In 1701, Frederick III, elector of Brandenburg, became first king of Prussia. In 1871 the king of Prussia became German emperor. The kings of Prussia of this line who have also been German emperors are William I, after 1871, Frederick III (1888) and William II (1888-1918). The proposal to raise Prince Leopold of Hohenzollern-Sigmaringen to the throne of Spain was the immediate cause of the Franco-German war.

**Hokkaido**, term used by the Japanese to designate the N part of the empire.

**Hokusai** (1760-1849). Eminent Japanese printer, was born at Honjo, in Yedo (now Tokio) the son of a tradesman. He got little encouragement at first, but in 1807 an association with Babin, as illustrator for a Chinese novel the latter had translated, resulted in his getting some recognition. By 1810 he had become more generally known, and once he was established as a teacher, he soon had so many

pupils that he had to resort to wood-engraving to supply them with his original drawings for copying purposes. This resulted in his *Miangwa*, or 'Ten Thousand Sketches,' which established his fame. His productive power was astonishing, no less than 30,000 of his drawings have been listed. There is a complete list of his works in Anderson's *Descriptive and Historical Catalogue of Chinese and Japanese Art* (1886). See also, Holmes, *Hokusai* (1899), Fenollosa, *Hokusai and His School* (1893).

**Holbein, Hans**, two German painters, father and son. (1) **HANS HOLBEIN THE ELDER** (c. 1460-1524), was born at Augsburg and formed his style upon the school of Roger van der Weyden, modified by a study of Italian tradition. An earnest, patient painter, his work was devoted chiefly to religious subjects. (2) **HANS HOLBEIN THE YOUNGER** (1497-1543), the greatest of all German mediæval painters, was born in Augsburg. In his youth he assisted his father, and in 1515 went with his elder brother Ambrosius (b. 1494), also a painter, to Basel, where he joined the painters' guild (1519). There, and at Lucerne, he was employed in portraiture, and in extensive wall decoration, such as his *Peasants' Dance*, his frescoes for the town hall, and his celebrated *Dance of Death*, in which he represents with biting satire each grade of humanity, from pope to beggar, terrorized by Death. He went to London (1526), furnished by Erasmus with an introduction to Sir Thomas More, and there he found ample employment as a portrait painter, and as such reached his mature reputation. A number of his finest religious pictures were painted prior to this first visit to England. At Windsor there is a collection of eighty-seven portraits of noted men of the period, drawn in colored chalks on tinted paper, most of which were engraved by Bartolozzi and published by Chamberlaine (1792-1800). On his return to Basel (1528), Holbein painted the portrait of his wife and two children, now in the Basel Museum. On his second visit to England (1532) he found powerful patrons in the German merchants of the Steelyard, and among others painted the portraits of *Hans of Antwerp* (Windsor), very delicate in drawing, and the finely finished *George Gysen* (Berlin). To 1533 belongs his masterpiece in portraiture, *The Ambassadors* (National Gallery), a remarkable and characteristic picture, about which much has been written.

Among the many fine portraits of his later years may be mentioned *The Duke of Nor-*

*folk*, 1539 (Windsor), the *Surgeon Chambers* (Vienna), and the portrait of himself in the Uffizzi—all admirable examples of the artist's close observation of character, extraordinary finish and elaboration of detail, delicacy of drawing, and clarity of tone. Holbein excelled also as a miniature painter.

**H O L C**, Home Owners' Loan Corporation. See UNITED STATES HISTORY, NEW DEAL.  
**Holden, Edward Singleton** (1846-1914), American astronomer and educator. He was director of the Washburn (Wis.) Observatory (1881-85), of the Lick Observatory (1888-98), president of the University of California (1883-88), and in 1901 was appointed librarian at West Point. His publications include *Index Catalogue of Nebulae* (1877), *Life of Sir William Herschel* (1881), *Essays in Astronomy* (1900).

**Holder, Charles Frederick** (1851-1915), American naturalist, was educated at the U. S. Naval Academy. In 1871-75 he became assistant curator of zoology in the American Museum of Natural History, New York City, and in 1891 was appointed to the chair of zoology of Throop Polytechnic Institute (Pasadena, Cal.), upon its organization. His works include *Marvels of Animal Life* (1886), *Big Game Fishes of the United States* (1903), *Life in the Open* (1906), *Big Game at Sea* (1908), *Game Fishes of the World* (1913), *Angling Adventures around the World* (1914).

**Holinshed, or Hollingshead, Raphael** (c. 1520-80), English chronicler. He lived in London in the reign of Elizabeth as translator for the printing-press of Reginald Wolfe, and when Wolfe planned a *Universal History*, the main part of the work (relating to the British Isles) was entrusted to Holinshed. The first edition appeared in 1577. His *Chronicle* was one of the sources upon which Shakespeare drew for his historical plays.

**Holl, Francis Montague**, known as **Frank Holl** (1845-88), English portrait painter. Sir John Millais, Lord Wolseley, and Gladstone were among his notable sitters.

**Holland**, city, Michigan, in Ottawa co., on the Black River, 6 miles e. of Lake Michigan, and on the Pere Marquette Railroad, 25 miles southwest of Grand Rapids. It is the seat of Hope College, the western institution of the Dutch Reformed Church, and the Western Theological Seminary. There are several summer resorts in the vicinity. It is an important manufacturing town having furniture factories, manufactures of sole leather, pickles, beet sugar, fruit packages, shoes,

lumber, leather, wood-working machinery, gelatine, borts, and pianos. Grain is exported by steamer to Chicago and Milwaukee, by way of Black River and Lake Michigan. Holland is the scene of the famous 'Tulip Time,' a week-long festival in which the whole town participates, and which draws visitors from far and wide. It was settled in 1847 and chartered in 1867, p. 14,616.

**Holland** (1) *North*, province, the Netherlands between the Zuider Zee and the North Sea, area, 1,065 sq miles. It is flat, low (large portions below sea-level, and protected by embankments or dikes), but is fertile, and produces cattle and cheese, flower bulbs (Harrlem), and potatoes. Fishing, shipping, and ship-building are carried on. The chief town is Amsterdam. (2) *South*, province, the Netherlands, stretching along the North Sea, towards the Haringvliet or mouth of the Scheldt, area, 1,133 sq miles. It is low (as much as 16 ft below sea level) and fertile, producing cattle and cheese, flowers and fruit. There are also brick works, manufactures of gun, shipping and fishing. The chief town is the Hague. See NETHERLANDS.

**Holland, Baron** See Fox, Henry

**Holland, Clifford Milburn** (1883-1924), American tunnel engineer, was born in Somerset, Mass. He was graduated from Harvard University in 1905 and became assistant engineer of the East River tunnels for the New York Rapid Transit Company. In 1907-19 he was assistant engineer for the Public Service Commission of New York City and in 1919 became chief engineer of the Hudson River Vehicular Tunnel, which was named in his honor, following his death during its construction.

**Holland, Edmund Milton** (1848-1913), American actor, was born in New York City. As E. Milton he was a member of Wallack's company (1867-79), and afterward played such parts as Old Rogers in *Esmeralda*, and Jenkins Hanby in *A Social Highwayman*, one of his best parts. His later rôles include Leopold Kolditz in *Hearts are Trumps* (1900), Eben Holden (1901), Gaffer Tyl in *The Blue Bird*, and Baron von Haugh in *Old Heidelberg*.

**Holland, Josiah Gilbert** (1819-81), American author and journalist. From 1849 to 1867 he was one of the editors, and after 1852 was also one of the owners of the Springfield *Republican*, and in 1870 he established in New York *Scribner's Monthly* (afterwards the *Century Magazine*) which he edited with great success until his death.

He published a successful *Life of Abraham Lincoln* (1865), some novels including *Mis Gilbert's Career* (1860) and *The Story of Seven Oaks* (1875), some verse, including *Bitter Sweet* (1858), and a number of collected essays from the *Republican* and *Scribner's*.

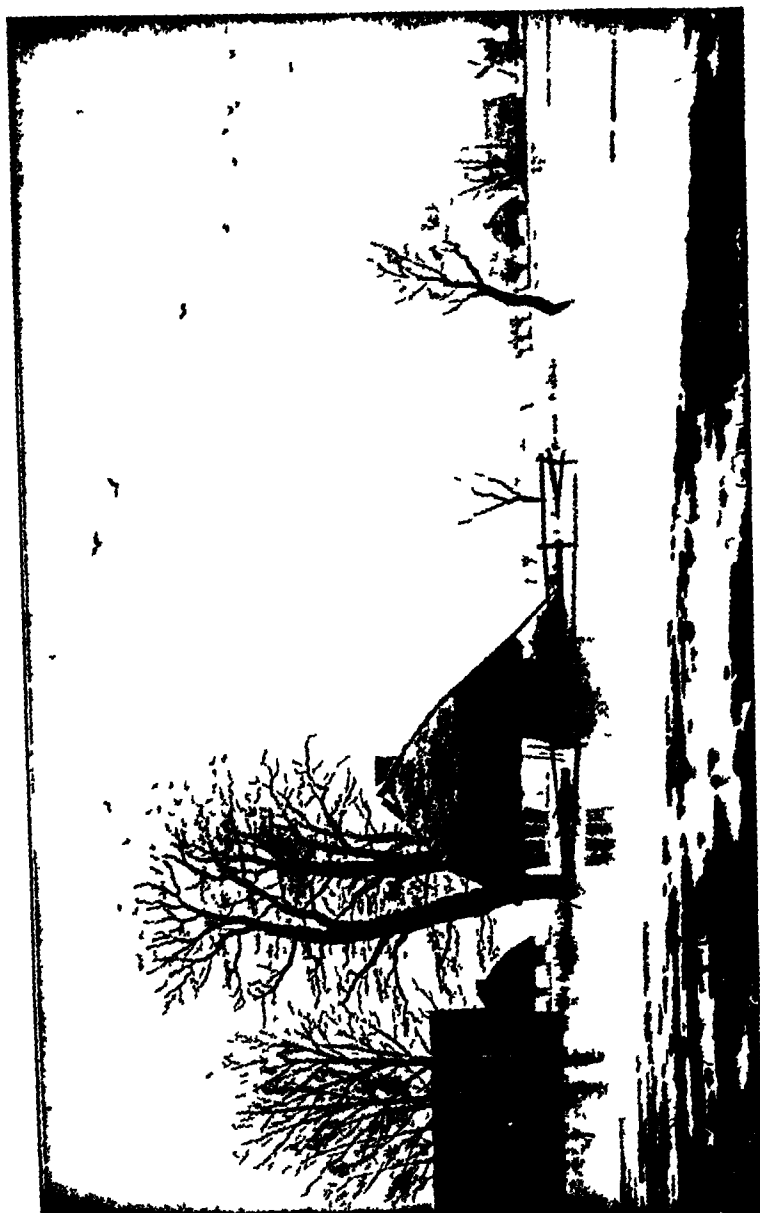
**Holland Tunnel** See Hudson River Vehicular Tunnel

**Hollander, Jacob Harry** (1871-1940), American economist, was born in Baltimore, and was educated at Johns Hopkins University. He was secretary of the Bimetallic Commission in 1897, and was associate professor of political economy at Johns Hopkins from 1901 to 1904, when he became full professor of that subject there. He was special commissioner for the revision of taxation laws in Porto Rico in 1900, and then treasurer of that island. In 1904 President Roosevelt appointed him commissioner to examine the financial status of Santo Domingo in connection with the claims then being pressed by certain foreign creditors, and in the same year he was made the government's special agent on taxation in Indian Territory. He has written *The Cincinnati Southern Railway: A study in Municipal Activity* (1894), *War Borrowing*, 1919, *Economic Liberalism*, 1925, *Want and Plenty*, 1932.

**Holles, Denzil, Lord** (1599-1680), English statesman. Having entered Parliament (1624), he advocated resistance to unjust taxation and religious innovations. He was one of the 'five members' against whom Charles I. imputed treason (1642). He played a prominent part at the Restoration, and acted as English ambassador in Paris (1663-6), and in 1667 negotiated the treaty of Breda.

**Holley, Alexander Lyman** (1832-82), American metallurgist, was born at Lakeville, Conn. With Zerah Colburn he published *The Permanent Way and Coal-Burning Locomotives of European Railways* (1858), which called attention to the extravagance of the American as compared with the English railroads. In 1863 he bought in England for an American firm the American rights to the Bessemer steel process and in 1865 he established at Troy the first Bessemer plant in the United States. Afterwards he designed similar plants for Pittsburgh, St. Louis, Joliet, Ill., and other places, and shared in the subsequent development of this process, taking out several patents for improvements.

**Holidaysburg**, bor. Pa., cap. of Blair co. It is the trading and manufacturing center of



A FLOOD IN HOLLAND



a coal, iron and limestone region, and has rolling mills, blast furnaces, car works, railroad shops, etc. Among the resorts and features of scenic interest are Lakemont Park, Chimney Rocks, Muleshoe Curve, and Horseshoe Curve. The Old Portage R. R., one of the oldest railroads in America, was constructed from Hollidaysburg to the top of Alleghany Mountains in the neighborhood, p 5,910

**Hollins College**, Hollins, Va., an educational institution for women, founded as a coeducational institution in 1842 and chartered as Valley Union Seminary in 1844, was

to the order Illicineæ, mostly inhabitants of temperate regions, and extensively cultivated. Their flowers are white, and usually inconspicuous, but the fruit, a scarlet berry, is often of great beauty, remaining over winter on the tree. These berries, contrasted with the shining, evergreen, spiny and wavy-edged foliage of the European holly (*I. aquifolium*), and the similar American *Ilex opaca*, have not only made them valuable as ornamental and hedge-trees, but have caused their branches to be extensively used in Christian decorations.

**Hollyhock** (*Althaea rosea*), a hardy, per-



Hollywood, California Street scene

the first chartered school in Virginia for the higher education of women and one of the first in the nation. In 1852 attendance was limited to women, in 1856 its name was changed to Hollins Institute and in 1911 to Hollins College in honor of Mr. and Mrs. John Hollins of Lynchburg. In 1932 the College became a public foundation with an endowment fund sufficient to insure its perpetuation.

**Holls, George Frederick William** (1857-1903), American lawyer. He was secretary and counsel of the American delegation to the first Peace Conference at The Hague in 1899, and wrote the article *Special Mediation* in the treaty drawn up at that time. He wrote *The Peace Conference at The Hague*.

**Holly** (*Ilex*), a genus of trees belonging

to the order Illicineæ, mostly inhabitants of temperate regions, and extensively cultivated. It flowers in the late summer and early autumn.

**Hollywood**, Calif., famous center of the motion-picture industry, a part of Los Angeles city since 1910.

**Holmes, John Haynes**, (1879- ), minister, was born in Philadelphia, Pa. After serving in Unitarian churches in Dorchester, Mass. and New York City, he organized the Community Church in New York. He was Vice-President of the National Association for Advancement of Colored People, Director of the American Civil Liberties Union, Associate Editor, *The World Tomorrow*. He wrote *Rethinking Religion* (1938), *Out of Darkness* (1942).

**Holmes, Oliver Wendell** (1809-94), American essayist and poet, was born at Cam-



bridge, Mass., and was educated at Phillips Andover Academy and at Harvard, where he graduated in 1829. The year after his graduation he wrote for the *Boston Advertiser* the stirring stanzas entitled 'Old Ironsides' in protest against the proposal to break up the old frigate *Constitution*. This poem made him famous, and incidentally had much to do with the preservation of the old ship. He next studied medicine for three years at the Harvard Medical School, and then for three years more in Paris, and two years after his return (1836) was appointed professor of anatomy at Dartmouth College, a post which he held for two years. He was Parkman professor of anatomy in the Harvard Medical School from 1847 to 1882, and wrote several papers on medical science.

His literary position was assured by the publication of *The Autocrat of the Breakfast Table* in the *Atlantic Monthly* in 1857. It was issued in book form the next year. *The Professor at the Breakfast Table* (published in book form in 1860), and *The Poet at the Breakfast Table* (1871-72) followed. Dr. Holmes published two novels, *Elsie Venner* (2 vols. 1861), and *The Guardian Angel* (2 vols. 1868). His other prose works include, *Soundings from the Atlantic*, essays (1864), *Mechanism in Thought and Morals* (1871), *A Moral Antipathy* (1885), *Our Hundred Days in Europe* (1887), and *Over the Tea-Cups* (1890). Of his serious poems, he himself is said to have preferred 'The Chambered Nautilus,' although this can hardly be considered superior to 'The Voiceless,' 'Sun and Shadow,' and 'Old Ironsides.' 'The Moral Bully' is a keen bit of satire, and 'The Wonderful One-Horse Show,' is a classic in humorous poetry, while *The Last Leaf*, except for one or two false notes, is a vivid expression of pure pathos. His principal volumes of poetry were published in the following order: *Urania* (1846), *Astraea* (1850), *Songs in Many Keys* (1861), *Songs of Many Seasons* (1875), and *The Iron Gate* (1880). See Morse's *Life and Letters of Holmes*, vols. xiv and xv of the *Collected Works* (1896), and the sketches in Higginson's *Old Cambridge* (1900), and Howell's *Literary Friends and Acquaintance* (1900).

Holmes, Oliver Wendell (1841-1935), American jurist, son of the essayist, was born in Boston, and was graduated from Harvard in 1861, and from the law school there, in 1866. He served three years with the 20th Massachusetts volunteers in the Civil War and was wounded at Ball's Bluff, at Antietam,

and at Fredericksburg. After the war he practised law in Boston, was editor of the *American Law Review* (1870-3), professor of law at Harvard (1882), associate justice (1882-99) and chief justice (1899-1902) of the Supreme Judicial Court of Massachusetts. He was appointed associate justice of the U



Oliver Wendell Holmes

S. Supreme Court, Dec. 4, 1902, and resigned on Jan. 12, 1932. He published *The Common Law* (1881) and edited Kent's *Commentaries Consult Life* by Silas Bent (1932).

Holmes' opinions were so often on the minority side that he became known as the court's 'Great Dissenter.' But he lived to see the rigid conservatism of the turn of the century superseded to a large degree by his own liberal social philosophy. John Morley called him the greatest judge of the English-speaking world and Justice Benjamin N. Cardozo, who succeeded Holmes on the Supreme bench, said his predecessor had 'picked a whole philosophy of legal method into a fragment of a paragraph' of *The Common Law*. The style of his opinions was as felicitous as that of the essays of his poet-father, his thought reflected the pragmatism of the friend of his young manhood, William James. Holmes bequeathed half of his estate, a sum estimated at \$250,000, to the United States, bringing, in death, a last token of his devotion to the ideals of democracy and enlightened patriotism.

Holmes, Sherlock, fictional character. See DOYLE, SIR ARTHUR CONAN.

Holocene, a local anesthetic, similar in many respects to cocaine, for which it is sometimes used as a substitute. It is a condensation product of phenacetin and para-phenetidin.

Holograph, a legal instrument, particularly a deed of conveyance or a will, wholly

in the handwriting of the person executing the same. In countries deriving their legal systems from the civil, or Roman law (including Scotland, Quebec, Louisiana, and the Spanish-American states) such writings are deemed to authenticate themselves without proof by subscribing witnesses, but in countries under the common-law system of England and the United States holographic instruments must be executed with the same formalities and their validity established in the same manner as any others.

**Holothurians**, a class (*Holothuroidea*) of echinoderms generally known as 'Sea Cucumbers,' owing to their resemblance to that vegetable. The body is cylindrical in form, with tough and muscular walls, with small calcareous spicules of various shapes in the skin. At one end is the mouth, surrounded by tentacles, often much branched and used to collect food, at the other is the cloaca, which gives off a pair of branched respiratory tubes. They are found in all seas, but congregate in the greatest numbers in Eastern waters. Off the coasts of Australia and in the tropical Pacific there occur large holothurians, which are gathered, dried, and sold in China as food, under the Malay name *trepang* or the French term *bêche de mer*. The Philippine and Sulu Islands supply much of this demand, the animals being obtained by native searchers near low-tide on rocky coasts. North American examples are chiefly more or less worm-like forms, living buried in the mud of flat shores, the most common being species of *Synapta*. Consult Arnold's *The Sea Beach at Ebb-Tide*.

**Holst, Hermann Eduard von** (1841-1904), German historical writer, was born in Fellin in Livonia. He was engaged in journalism after 1866 in New York, became professor of history at Strassburg (1872) and at Freiburg (1874), and from 1892 to 1900 held the chair of history in the University of Chicago. After 1900 he again lived in Germany. His chief work is *The Constitutional and Political History of the United States*.

**Holt, Hamilton** (1872- ), American editor and educator, educated at Yale and Columbia, with the *Independent* (1897-1911), president Rollins College, Florida (1925- ).

**Holt, Henry** (1840-1926), American publisher and author, was born in Baltimore, Md. In 1863 he entered the publishing business with G. P. Putnam, and in 1873 became president of the firm of Henry Holt & Co., New York. He was a fellow of the American As-

sociation for the Advancement of Political Science. He published *Talks on Civics* (1901), *Sturmsee, Man and Man* (1905), *The Cosmic Relations and Immortality* (1919). He edited the *Unpopular* and the *Unpartisan Reviews*.

**Holt, Joseph** (1807-1894), American jurist, was born in Breckinridge co., Kentucky, and began to practice law in 1828. In 1857 he was appointed commissioner of patents, was made Postmaster-General two years later, and in 1860 became Secretary of War. Lincoln made him judge advocate of the army. The courts before which Fitz-John Porter and Lincoln's assassins were tried are among those over which he presided.

**Holtei, Karl von** (1798-1880), German poet and playwright, was born in Breslau. He made his debut there in 1819, but abandoned acting for theatrical management and writing. In 1823 he produced *Die Wiener in Berlin* and *Die Berliner in Wien*, and in 1826 *Poems*. From that time until his death he managed different theatres in Berlin, Breslau, Darmstadt, and elsewhere, and wrote a number of novels. His most popular work is *Schlessische Gedichte* (1830), which reached a 22d edition in 1905.

**Holton, Luther Hamilton** (1817-80), Canadian statesman. In 1854-7 he was a member of the Canadian Legislative Assembly, and in 1862-3 a member of the Canadian Legislative Council for the Victoria Division. He was Commissioner of Public Works (1863), Minister of Finance (1863-4), and in 1867 was elected to the first Dominion Parliament. He was an ardent free trader, and a strong opponent of Canadian confederation.

**Holtz, Wilhelm** (1836-1913), German physicist, invented the electrical machine which bears his name. He became assistant in the physical laboratory in Greifswald in 1877, and later was made professor. He carried on extensive research work, and wrote many papers on electricity for scientific journals.

**Holtzmann, Heinrich Julius** (1832-1910), German New Testament scholar, was born in Karlsruhe. He became professor of theology at Heidelberg in 1865 and in 1874 was called to Strassburg. His great erudition and penetrating intellect were exercised in dealing with the synoptic problem, and it is his solution, more or less modified, which holds the field today (see GOSPELS).

**Holy Alliance**, a league formed by the sovereigns of Russia, Austria, and Prussia with the declared intention that they would

be guided both in their internal administration and in their foreign policy by the lofty principles of Christianity. The document was drawn up by Alexander I of Russia, and signed at Paris on Sept. 26, 1815. Alexander was probably the only sovereign who signed it with any real conviction, though it was later acceded to by the other European sovereigns. Great Britain, while commending the document, never signed it. France repudiated it, England refused to give it any support, and by 1825 it had ceased to be of importance. An attempt to extend its influence to America brought about the famous Monroe Doctrine.

**Holy Communion** See Eucharist

In 1901, when the Law of Associations was passed, there were a number of flourishing colleges and schools conducted by the order in France, these were closed, and by 1903 the order was greatly reduced. Missions established in Bengal, Canada and the United States, however, have met with success. The order was introduced into the United States by Father Edward Sorin in 1842 at South Bend, Ind., and has grown into the flourishing Notre Dame du Lac University. St. Mary's College for Girls at Notre Dame is under the direction of the Congregation and there are also colleges in Oregon, Wisconsin, Ohio, Texas and Louisiana as well as various high and primary schools in other States.



*Holy Cross College*

Alumni Hall (left) and O'Kane Building (right)

**Holy Cross, College of the,** a Roman Catholic college under the control of the Fathers of the Society of Jesus, situated in Worcester, Mass. It was founded by Bishop Fenwick in 1843 and is the oldest Catholic college in New England. The buildings are situated on an eminence overlooking the city of Worcester. The system of education is the one in use in all the colleges of the Society of Jesus, and is guided by the principles laid down in the famous Ratio Studiorum. The degree of A.B. is granted. For latest statistics see Table of Colleges and Universities under UNIVERSITY.

**Holy Cross, Congregation of,** a body of priests and lay brothers formed in France in 1836 by the union of the Brothers of St. Joseph, founded at Ruille in 1820 and the Auxiliary Priests of Le Mans established in 1835. In 1857 the constitution and rules of the congregation were approved by Rome.

There is a Congregation of Sisters of the Holy Cross whose work is educational and charitable.

**Holy Cross, Order of,** the name given to several medieval orders in Italy, England, Germany, France and other countries. In Italy the order increased in importance until the fourteenth century, when it began to degenerate and was at length dissolved in 1656. In 1211 a canon of Liege founded at Huy an order of the Holy Cross which spread through France, Holland, part of Germany, and England. In England the order was known as the Crutched Friars. Although greatly reduced by the Reformation, it is still in existence, having two houses in Belgium, two in Holland and one in Germany. In the American Episcopal Church an order of the Holy Cross was founded in 1881 whose chief work is the carrying on of missions and retreats.

**Holy Cross Mountain**, peak of the Rockies, Colorado, in Eagle co., about 15 m. n.w. of Leadville Height, 14,000 ft. Its main feature is the cruciform appearance of two snow-filled ravines, whence its name.

**Holy Grail**, *The See Grail*, **Holy**

**Holyhead**, market town and seaport in Anglesey, Wales, is situated in the north-western part, on Holyhead Bay. It is a port of call for liners from New York and the starting point of the mail steamers to Dublin.

**Holy Land** *See Palestine*

**Holyoke**, city, Massachusetts, in Hampden co., on the w. bank of the Connecticut River. The river here has a total fall of about 60 ft., and by means of a dam over 1,000 ft. long, water power is obtained. The paper industry is one of the most important in the world, and there are extensive manufactures of cotton, worsted, and alpaca goods, thread, silk, wire, hardware, automobiles, bicycles, and machinery. The great fall in the river also affords opportunity for testing water-wheels. The surrounding scenery is picturesque. Mt. Tom (1,215 ft.) is nearby. Holyoke is the nearest railroad station to Mt. Holyoke College. The famous Dinosaur 'Tracks' are located here, p. 53,750.

**Holyoke, Mount**, a steep ridge in Massachusetts, about 3 miles southeast of Northampton. A road and a funicular railway lead to the summit, from which there is a magnificent view over the Connecticut valley. Height, 954 ft.

**Holy Orders** *See Orders*, **Holy**

**Holy Roman Empire**, practically the empire of which Charles the Great was crowned emperor in 800 A.D. at Rome. The Roman Empire was broken to pieces in the 5th century by the successive inroads of German tribes, Goths, Vandals, Burgundians, Franks, and others. These German conquests, after a long period of turmoil, resulted in the foundation of the modern European states, whose separate independence is the negation of the idea of universal rule which was embodied in the extensive dominions of the old Roman emperors. The year 476 A.D., when Romulus Augustus was deposed by the barbarian Odoacer, has been accepted as marking the extinction of the Roman empire, at any rate in western Europe, and has thus come to be regarded as on the whole the best dividing date between 'ancient' and 'modern' history. Thus the emperor in Constantinople became, after 476, the sole head of a united empire, whose distant sovereignty was undisputed,

though its actual exercise was impossible in the western provinces. This state of things lasted for nearly three centuries, and might have gone on until the empty form became so unreal and obsolete that it gradually decayed away. But this process of slow decay was interrupted by two events—the growing power of the papacy, and the invasion of Italy by another heathen and barbarous people of German origin, the Lombards.

Upon the papacy fell the main burden of resisting Lombard encroachments during the 7th and 8th centuries. From Constantinople little efficient aid was received after the temporary successes of the generals of Justinian. But the popes had too little military strength to withstand the Lombard rulers without external assistance. Estranged from the East, they sought succor from the great western power which was being built up by the Franks. The alliance of the Frankish dynasty with the bishop of Rome was finally cemented in 800, when Leo III placed the imperial crown on the brow of Charles the Great. Thus Italy passed under the rule of a German king. But the great Frankish power which Charles the Great and his predecessors had built up did not prove sufficiently lasting to be the foundation on which the traditions of the Roman empire could securely rest. Out of the permutations and combinations of territory among his successors three main subdivisions gradually emerge. Western Francia became in time the historic kingdom of France, Eastern Francia became Alemannia, or Germany.

Amidst the general anarchy, the first movement of reorganization came from Germany. Henry the Fowler (918-936), duke of the Saxons, formed a fairly coherent state by combining the German duchies to resist the barbarian invasions. His son and successor, Otto the Great (936-973), continued his policy, and raised the German monarchy to a commanding place in Europe. In 951 he assumed the crown of Italy, and in 962 he was crowned emperor by Pope John XII. Otto the Great did not rule such vast dominions as had owned the sway of Charles the Great, but his coronation is in some ways a more memorable event than that of his famous predecessor.

From the first there was something unreal about the Roman Empire, and as time went on it became more and more a shadowy anachronism. In mediæval theory Christendom was a single state under the secular headship of the emperor and the spiritual headship of the Pope. They were the two

vicegerents of the Deity. For a time the balance of success rested with the spiritual power, but every victory gained by the pope, from Hildebrand to Innocent III, was a blow to that fundamental idea of unity bequeathed by Rome, on which the claims of both popes and emperors were based. And if the union of the Roman empire with the German monarchy was fatal to the power of the former, it was equally ruinous to the latter. In the 10th century the German king was one of the strongest territorial rulers in Europe, by the close of the 13th century he had become one of the weakest.

By the 16th century the Holy Roman Empire seemed to be, and was, a complete anachronism. The very conception of unity had been destroyed by the growth of coherent and powerful nations in France, Spain, and England. No emperor after Charles V made any real effort to assert imperial authority outside of Germany. The emperors were nothing more than German kings, and even in Germany they had little real power. The empire, as Hobbes put it, was neither holy, nor Roman, nor an empire. When Napoleon became emperor of the French, and when his conquests made him supreme in western Europe, and a dictator in Germany itself, it became obviously preposterous for an Austrian archduke, even though he was also king in Hungary and Bohemia, to bear titles which purported to carry with them the rule of the world. Francis II, bowing to the inevitable, formally resigned these titles in 1806, and consoled himself for his degradation with the preposterous and unhistorical designation of emperor of Austria, which he had already tacked on to his other dignities in 1804. See James Bryce's *The Holy Roman Empire* (1889, rev. and enlarged ed. 1904).

**Holyrood**, royal palace at Edinburgh, once an abbey, and for centuries the residence of the Scottish sovereigns. The abbey, which has been in ruins since 1688, was founded by David I in 1128. The palace was commenced about 1501, and is especially famous as the residence of Queen Mary, and the scene of the murder of her favorite, David Rizzio, in 1566.

**Holy Sepulchre, Knights of The**. See **Hospitallers**.

**Holy Spirit, The, or Holy Ghost, or Paraclete**—i.e. advocate—in Christian theology the third person of the Trinity. The doctrine of the Holy Spirit is a distinctively Christian one, but foreshadowings of it are

believed by some to be found in the Old Testament. The early Christians saw His work in the form of extraordinary gifts, as at the day of Pentecost, which inaugurated the new dispensation, for Paul, He is the principle of the divine life in the community, the begetter of all the spiritual graces. But the Spirit's proper personality is most clearly found in John. Yet the early church did not forthwith attain to a complete doctrine, nor was it, in fact, till after the essential divinity of Jesus had received full ecclesiastical sanction that the personality of the Spirit was explicitly recognized, and the doctrine of the Trinity formulated. For the question as to whether the Spirit proceeds from the Father alone, or from the Father and the Son (*filioque*), which ultimately brought about the separation of the Greek and Latin Churches, see **GREEK CHURCH**, **TRINITY**. Consult Hoyle's *Holy Spirit in St Paul* (1928), Watkin-Jones, *The Holy Spirit from Arminius to Wesley* (1929), Pohle's *Divine Trinity* (1930).

**Holystone**, a piece of soft sandstone, employed in scouring the deck of a ship.

**Holy Thursday**. See **Ascension Day**, **Maundy Thursday**.

**Holy Water**, signifies water blessed by a priest or bishop for certain religious uses. Sprinkling the hands and face with water before entering the sanctuary, prescribed in the Jewish law for those ceremonially unclean, was early adopted in the Christian Church. It is expressly mentioned by Tertullian in the end of the second century, and that the water so employed was blessed by the priests we learn from St Jerome, and from the Apostolical Constitutions. In the Roman Catholic Church water is solemnly blessed by the priest or bishop on Holy Saturday. Holy water is placed in fonts at the doors of churches, that worshippers may sprinkle themselves with it, before high mass. On Sundays the celebrant sprinkles the people with holy water, and it is used in nearly every blessing given by the church.

**Holy Week**, the week immediately preceding Easter, set apart to the commemoration of the Passion of the Redeemer. See **PALM SUNDAY**, **MAUNDY THURSDAY**, **GOOD FRIDAY**, **EASTER**.

**Homage**, in the feudal law, the formal submission of the vassal to his lord upon the investiture of the former. It was a solemn declaration of allegiance, and in theory constituted the tie which created the relation of

lord and tenant. It was exacted of all military tenants, the lesser obligation of fealty being all that was required of socage tenants.

**Homburg vor der Höhe**, watering place in Prussian province of Hesse-Nassau, stands at the southeast foot of the Taunus Mountains. Its mineral springs are among the best known in Europe, p. 17,280.

**Home Economics** The *Economics* of Xenophon is the beginning of the literature of the subject that has now come to be defined as 'home economics'. In the United States it has had its widest and fullest development. The term *home economics* is the one officially approved by the professional group, The American Home Economics Association, organized in 1909. Household management is an enormous enterprise, embracing the operation of 28,000,000 family homes in America, and the spending (in a normal year) of \$52,000,000,000, or a billion dollars a week. In time of depression the task is serious, calling for skill in substituting low-cost for high-cost diet of equal nourishment, and in maintaining home morale under trying conditions.

The great changes brought about by Frederick W. Taylor's 'scientific management' in industry, stressing the use of planning principles, orderly routine, motion study of labor operations, etc., led Mrs. Christine Frederick, of New York, in 1911, to the belief that the home could also benefit from the application of the same principles of scientific management. The results of a year's experiments at the Applecroft Experiment Station led Mrs. Frederick to present them before the Efficiency Society. They were published in *The Ladies' Home Journal* (1912) and since brought together in a volume, *The New Housekeeping*. The theory spread to European countries, it marked the end of an era extending centuries back, when 'women's work' was never done and was regarded as hopeless drudgery without mental interest. Needless labor was supplanted by new tools and plans, science was introduced into the home and welcomed. Coincident with this new outlook on household management came new labor-saving devices. Industry discovered the potential market for such equipment, with the result that today there are millions of homes wholly or partially modernized. Whereas 'home management' once meant only household hygiene, cleaning, accounts, etc., it now includes labor-saving routine, orderly arrangement, intellectual application and

higher standards. Many social factors enter into the scheme.

Food, as a division of home economics, includes all the problems of Diet and Dietetics, in which America has made great strides. Marketing, storage (and cold storage), cookery, serving, meal-planning, care of waste, use of left-overs, selection and use of utensils, fuel, preservation of food—all these are divisions of the subject. The pure food crusade of several decades ago produced valuable reforms, but vigilance is still necessary. Canned foods are rising to higher standards and their consumption has increased enormously. From one can per family in 1865, canned food consumption had grown to 133 cans per family in 1930, while the proportion of food in packages has also increased immensely.

Clothing, the next subdivision of home economics, has fallen in relative importance of technique. Home sewing has declined, replaced by cheap mass production of even fashionable wearing apparel. Training in clothing now includes buying, color values, ensembles, style and suitability for type, size, and occasion. Shelter is a term used to designate house and house planning—another subject that received a new impetus under the stimulation of modernistic designs and new conceptions of home-planning and the desirability of planning kitchens and other rooms for greater efficiency, artistry, light, ventilation, spaciousness, sanitation and cost. Other subdivisions in home economics are Operating, Advancement, Savings. Operating is the cost of fuel, ice, service, equipment, etc., though many women regard the purchase of an electric refrigerator as 'advancement' no less than the acquisition of a radio, or an automobile. As living standards rise, the distinction between luxuries and necessities tends to disappear.

Advancement is a classification for such as education, culture, travel, entertainment, welfare, etc., which presumably represent the ultimate ends of desire or spending. Education in Home Economics.—New England has the oldest tradition of definite home training but only in sewing, which was introduced to Boston public schools in 1789. Not until Toledo, Ohio, introduced 'domestic science' in 1884 was there a general development in this branch of education. It is now general in elementary schools (sewing beginning usually in the fifth and cookery in the seventh grade) and of course also in high school. There are

still thousands of girls in schools where no tuition of this kind is given, the expense of maintenance makes its extension rather slow. In the Middle West the work grew rapidly in the State universities, and almost invariably in the agricultural schools. The State colleges of agriculture in most of the Eastern States gave this training, that at Cornell having the largest and strongest department.

Since 1918 a rapidly-increasing use for women trained in home economics has been with public utilities companies, with food manufacturers, with advertising agencies, with newspapers and magazines, with large retail stores, with wholesale and retail stores and style organizations. In diet and nutrition work, hotels, sanatoriums, schools, hospitals, clubs, public institutions, missionary, welfare and charity work, etc., have also provided many careers. Graduates in home economics have also been employed as managing housekeepers in private households, or for domestic service of a well-paid, specialized type. About 2,000,000 girls attend high schools, and about half receive some home training. Government Support—Through the State and national agricultural departments a great deal has been done in spreading home economics into rural districts. Nutrition science was notably advanced by Prof. W. O. Atwater, director of the first agricultural experiment station, Middletown, Conn., 1875, and later by the U. S. Office of Experiment Stations.

By common consent, Mrs. Ellen H. Richards is regarded as the dean of all home economic experts, at the Massachusetts Institute of Technology, an expert in sanitary chemistry, Mrs. Richards advocated more science in the home, for which she coined the word 'euthenics'. Mrs. Christine Frederick, founder of the Applecroft Home Experiment Station at Greenlawn, Long Island, N. Y., occupies a high position among modern leaders, and Mrs. Lillian Gilbreth is noted for kitchen designing and household efficiency. In connection with this article see BUDGET, FAMILY, COOKERY, DIET AND DIETETICS, FOOD, FURNITURE, HEATING, HOUSING, VENTILATION. Consult Lillian M. Gilbreth's *The Homemaker and Her Job*, Della T. Lute's *A Home of Your Own*, Elizabeth and Forrester MacDonald's *Homemaking, A Profession for Men and Women*, Hazel Schultz's *Making Homes*, Mrs. Frederick's *Ignoramus's Book of Housekeeping and Selling Mrs. Consumer*, Edith Hawley's *Economics of Food Consumption*, National Industrial Conference Board's *Cost of Living in New York*

*City, 1926*, Berridge-Winslow-Flinn's *Purchasing Power of the Consumer*, *Literary Digest's Zanesville and 36 other American Communities*, Stuart Chase's *Your Money's Worth*, Harris and Huston's *New Home Economics Omnibus* (1945).

**Home Guards, or Home Defense Leagues**, citizen organizations formed to act as a reserve to the regular police force, supplementing or taking over the routine work of that force in cases of emergency or in war time, and performing other civic and social services. One of the most typical and important of these organizations in the United States was the Home Defense League of New York City, which was created by Police Commissioner Woods in 1915, with a special view to releasing the police of the city for military service in case of war. In May, 1917, over 600 members of the New York City League took the places of patrolmen and trafficmen. The total membership was about 20,000. The League was supplanted by the Police Reserves of New York City, which ceased to function since Jan. 1, 1926.

**Home Loan Bank Act**, a measure passed by both houses of Congress on July 16, 1932, provides (1) for a system of 8 to 12 government-supervised banks to assist in construction and financing of homes by individuals, each bank to be capitalized at \$5,000,000 and supported by a government fund of \$125,000,000. (2) The system to be administered by a special board having \$300,000 for expenses. (3) Permits these regional banks to discount the security which eligible associations receive from home owners, (4) circulation privileges for government bonds bearing up to 3½ per cent interest are extended to three years so that the national banks may use the bonds as security for temporary currency expansion, totaling nearly \$1,000,000,000. Franklin W. Fort, a New Jersey banker, was appointed chairman of the Board by the President, other members were W. B. Best, Pittsburgh, Dr. J. M. Gries of Ohio, N. Adams, Texas, and M. M. Bodfish of Chicago. This timely relief was prompted by the severe hardships brought upon countless home owners during the depression. In 1933 about half of the counties in the U. S. were without local thrift and home-financing facilities, and many existing institutions were unable to meet the needs of investors or borrowers. By June 30, 1940, 1,455 federal associations were in operation, located in all the states and in Hawaii and Alaska. See UNITED STATES, NEW DEAL.

**Homeopathy** See **Homoeopathy**

**Homeopathy, American Institute of**, the oldest national medical organization in the United States, was founded in 1841. It exists to advance the principles of homeopathy and to improve materia medica. It holds annual meetings, and publishes monthly *The Journal of the American Institute of Homeopathy*.

**Homer**, the author of the *Iliad* and the *Odyssey*, probably lived in the 12th century B.C. His birthplace is doubtful, even in antiquity seven cities contended for the honor. The *Iliad* tells the story, not of the whole Trojan War, but of some of the chief events in the last of the ten years of its duration. The subject of the *Odyssey* is the return of Odysseus from Troy to his home in Ithaca. Owing to various reasons this homecoming was delayed for ten years, during which he wandered far and wide.

The subject of each poem possesses a remarkable unity. This unity is not the least of the evidences of the genius of Homer. Next to this unity we may place his command of a varied, expressive, and harmonious vocabulary, which enables him both to describe the most ordinary actions of life, and at the same time to express with unsurpassed sublimity the heroic actions and passions of his heroes. Then we must observe his dramatic power, which has made his chief characters—Achilles, Hector, Agamemnon, Nestor, and Odysseus—live as do few personages in authentic history, the marvellous art by which, while never condoning the guilt of Helen, he yet wins for her his reader's love, and justifies her place as his heroine, his perfect purity and deep religious feeling, his practical wisdom and sound morality, which made his poems the Bible of Greece, the accurate observation of nature, that indescribable freshness and naturalness, the perfection of his verbal form, which is conveyed to our ears through the medium of the hexameter, that incomparable measure which is found alone in the Greek language.

From a very early time the Homeric poems were studied with great care—e.g., by the poet Antimachus and the philosopher Aristotle and especially by the three great Alexandrian critics Zenodotus, Aristophanes and Aristarchus, whose lives roughly cover the period from 260 to 150 B.C. Of these Aristarchus was much the greatest; he not only amended the text but also fully commented on it. It was he who divided the *Iliad* and the *Odyssey* each into twenty-four books. He also refuted, as

was held, the Chcerizontes, or 'separators', who assigned the two poems to different authors.

We may believe in the authenticity of the *Iliad* as a whole, as the work of one great poet, while admitting the possibility of large interpolations, such as that of bk. 6. But that the *Odyssey* is the work of the same poet can hardly be seriously contended. Its later date is shown by its tacit recognition of the existence of the *Iliad*, its imitation of phrases in the *Iliad*, its nearer approach to later Greek in point of grammar, its different view of the gods and its variations in mythology, and its wider geographical knowledge.

Of the following facts we may be certain. Homer was long anterior to the cyclic poets (750 B.C., and later) and to Hesiod (800 B.C.), and knew nothing of Greek colonies in Asia (eleventh century B.C.) or elsewhere, or of the Doric invasion of the Peloponnesus, usually dated about 1100 B.C. He was, therefore, earlier than the date last mentioned. It seems as if the civilization with which he was familiar resembled closely the Mycenaean. In some respects, however, especially in regard to the armor used by his heroes, he appears to belong to a later date than that of which the discoveries of Schliemann and others have found evidence. We may therefore assume that he was contemporary with the 12th century of that civilization—i.e., the twelfth before Christ. *Bibliography*—The best editions of the *Iliad* and the *Odyssey* are: Text of the *Iliad*, Monro, Van Leeuwen, Dr Costa and Fick, text of the *Odyssey*, Monro, Iudwich, Van Leeuwen and Dr Costa. Of translations into English, besides the older works of Chapman and Pope, there are Ford Derby's *Iliad*, Blackie's *Iliad*, Worsley's *Odyssey*, Wey's *Iliad*, and William Morris' *Odyssey*, in verse, and in prose, Lang, and Leaf, and Myers' *Iliad*, and Butcher and Lang's *Odyssey*.

**Homer, Louise (Beretty)** (1872-1947), American opera singer, was born in Pittsburgh, Pa. She studied under W. L. Whitner and Sidney Homer (whom she married) and Mme. Koenig in Paris, and in 1898 made her debut at Vichy as Itonora in *La Fanciulla del Danubio*. In 1900 she became one of the leading members of the Metropolitan Opera House.

**Homer, Winslow** (1846-1910), American painter, was born in Boston, Mass. He passed his early life in Cambridge, Mass., studied lithography for two years, and in 1867 began work as an illustrator. Two years later he removed to New York. During the Civil



War he represented *Harper's Weekly* as artist and correspondent at the front, and in 1867 he visited Europe, where he exhibited with success in Paris, Brussels, and Antwerp. In 1881 Homer visited Tynemouth on the British coast, where he painted a notable series of water colors and several pictures in oils of the work of the coast guardsmen and fishermen. In 1884 he settled permanently at Prout's Neck, Me., from this time on devoting himself chiefly to the painting of the marine scenes for which he is best known. These include *The Life Line* (1884), *The Fog Warning* (1885) and *Lookout—All's Well* (1896), in the Boston Art Museum, *Under-tow* (1886), *Eight Bells* (1886), *The West Wind* (1891), and *A Summer Night* (1890), in the Luxembourg, Paris, *Northeast* (1895), *Cannon Rock* (1895), *The Maine Coast* (1896), and *The Gulf Stream* (1899), in the Metropolitan Museum. Homer was a member of the American Academy of Arts and Letters. Consult W. H. Downes' *The Life and Works of Winslow Homer*.

**Home Rule**, in general, the control of local affairs in any state, county, or other administrative unit, by the people of that unit, rather than by the dominant sovereignty. The term is used especially in connection with the Irish movement for self-government under British sovereignty. The earlier stages of the agitation for Irish self-government are represented by the repeal movement of Daniel O'Connell, the Young Ireland Rebellion of 1848, and the Fenian rising twenty years later (see IRELAND, *History*). In 1873 the term 'Home Rule' was invented by Isaac Butt, leader of the Irish Parliamentary party. On the death of Butt, in 1879, Charles Stewart Parnell became the real leader of the Nationalists (see PARNELL, C. S.). The general election of 1885 greatly strengthened the party of Parnell, and he held the controlling influence in the House of Commons. On April 6, 1886, W. E. Gladstone introduced his first Home Rule Bill, and thereby broke up the old Liberal Party. This Bill was defeated on June 7, 1886. Gladstone introduced his second Home Rule Bill in 1893, which passed the third reading in the House of Commons, but was defeated in the House of Lords.

The third Home Rule Bill was introduced by H. H. Asquith's government in April, 1912. It differed in many material respects from Gladstone's measures, chiefly in the absence of any Irish contribution to imperial expenditure, and in the much larger financial powers granted to an Irish government. It

provided for an Irish Parliament with a House of Commons containing 164 members, and a nominated House of Lords—such parliament to have power to legislate on all subjects, with the exception of those matters which were not Irish, those subjects which the Imperial Government reserves to itself, certain specified matters like treason and foreign treaties, and the endowment of any religion or the establishment of religious preferences. The Imperial Government could at any moment pass a law on an Irish question over the head of the Irish Parliament. Further, the Lord Lieutenant could veto any law or reserve it for the consideration of the Imperial Government. This Bill passed the House of Commons, but was defeated by the House of Lords in January, 1913. It was re-introduced in May, 1913, and for the second time was passed by the House of Commons and rejected by the Lords. It was again brought before the Commons on March 5, 1914, and on May 25 was passed by a vote of 351 to 274. Under the provisions of the Parliamentary Act of 1911 it then became the law, regardless of the Lords. King George signed the Home Rule Bill on Sept. 18, 1914.

There was violent opposition from Ulster, and on Feb. 25, 1920, a new Home Rule bill, providing for two separate legislatures—one for Southern and one for Northern Ireland, with an Irish Council as a link between the two, was introduced into the House of Commons. It passed its third reading on Nov. 11 and received the assent of the Lords on Dec. 20, 1920. This was not acceptable, however, to Southern Ireland, and further attempts to settle the question resulted on Dec. 6, 1922, in the conclusion of a treaty granting Ireland the same status as the other British dominions. Specific provision was made for the exemption of Northern Ireland from the terms of the treaty. In October, 1922, an Irish Constitution was adopted, and on Dec. 6, 1922, the Irish Free State was formally established by royal proclamation. See also IRELAND.

**Home Sickness**. See *Nostalgia*.

**Homestead**, borough, Pennsylvania, Allegheny co., on the Monongahela River. Homestead is one of the world's greatest iron and steel-producing centers. It also manufactures mill machinery, engines, steel car wheels, high grade valves, pipes, fire brick, concrete blocks, tiles, cellar doors, iron fences, fire escapes, cigars, violins, phonographs, plumbers' supplies, chemical products, and ice, p. 19,032.

**Homestead Laws**, in the United States,

are of two kinds (1) Federal Homestead Acts under which the unoccupied public lands of the United States have been opened to settlement by *bona fide* settlers for the purpose of establishing permanent homes. See PUBLIC LANDS OF THE U. S. (2) Laws enacted in most of the States for securing a family against the loss of a modest home through the claims of creditors, but varying widely in different States. The exemption from debts is only partial, certain classes of claims (as mortgages, liens for improvement, taxes, etc.) being enforceable against the homestead. Canada, Australia, and New Zealand have homestead laws modelled on the American plan.

**Homicide**, the most general term for the killing of one human being by another, otherwise than by command of the state. It includes accidental and justifiable killing, as well as wilful murder, but not the execution of the death penalty nor the killing of the public enemy in war. Homicide is justifiable where necessary to prevent murder or other atrocious crime of violence, or to prevent the escape of a felon, it is excusable as in self-defence or in the protection of one's wife, child, parent, or property. All other homicides are punishable as felonies.

**Homildon Hill**, one of the Cheviot heights, near the village of Homildon or Humbleton, Northumberland, England. Here (Sept. 14, 1402) Douglas, with an army of 10,000 Scots, was defeated by an English force under Hotspur and the Earl of March.

**Homily**, a discourse held with one or more individuals, but in ecclesiastical use a discourse held in the church. The practice of explaining in a popular form the lessons of Scripture read in the synagogues had prevailed among the Jews, and appears to have been adopted in the Christian churches from the earliest times. A large collection of Old English homilies has been left by Ælfric, and much of the literature of the Middle Ages is homiletic.

**Homine Replegiando**, an ancient common law writ for securing the release of a person unlawfully imprisoned, by bailing him out.

**Hominidæ**, the family to which man belongs of the order of primates.

**Hominy**, white Indian-corn kernels, broken into particles of uniform size after the fibrous parts and the germ have been removed.

**Homocercal**, the condition in the tail of fishes when the upper and lower lobes are of

equal size, and the vertebral column continues straight. The homocercal tail is found in most teleosts and in some gnathostomes. Examples may be seen in cod, mackerel, haddock.

**Homoeopathy**, now **Homeopathy**, a system of medicine, which teaches that diseases should be treated or cured by drugs capable of producing similar symptoms of disordered health to those presented by them. This system is based upon the discoveries of Samuel Hahnemann of Saxony, enunciated by him in his *Science of Therapeutics* in 1796. Hahnemann's reasoning regarding the causes of disease is today supplanted by the accepted discoveries of modern research into the etiology of disease. In 1821 the first homeopathic journal was published, the *Archive of the Homoeopathic Method of Curing*, appearing in that year in Leipzig. But the growth of homeopathy has been slow in Germany. In the United States homeopathy has flourished. It was brought to America by Dr. H. B. Grant in 1825, and it is in this country, freed from restrictions, that it has gained greatest recognition. Homeopathic physicians have won the right to representation, national, State, and local. Many institutions allow them to compete for medical and surgical services, and they have their own board of medical examiners in many States. In the homeopathic medical schools the pathology of disease is taught, as are all the fundamental sciences upon which the modern practice of medicine is based. In 1916 about 15,000 homeopathic practitioners were registered in the United States, and there were 10 homeopathic medical schools. There were over 100 public hospitals and sanatoria under homeopathic management, and a number of medical journals.

**Homologous Series**, in chemistry. The hydrocarbons and their derivatives are remarkable as occurring in families of apparently unlimited size, between the members of which there is a constant difference of composition. Whenever organic compounds show great resemblance in their chemical properties, differing in composition by  $n \times CH_2$ , they are said to be homologous. See HYDROCARBONS.

**Homology**. When two organs are similar in structure and development though not necessarily in function these organs are said to be homologous.

**Homonyms**, in philology, are words having the same sound but different meaning and derivation.

**Homocousion**, **Homocousian**, two terms,

meaning respectively 'of the same substance' (with God) and 'of similar substance,' which formed the party watchwords of the great church controversy of the third century regarding the nature of Christ. The former was adopted by the Athanasians, the latter by the Arians, or rather semi-Arians.

**Homoptera**, a suborder of Hemiptera, including the cicadas, aphids, scale insects, and the like, whose fore wings generally resemble the hind wings.

**Homotaxial**. Professor Huxley pointed out that very different assemblages of animals and plants inhabit different regions of the globe, hence, he argued, the mere fact that two series of rocks in different regions contain similar assemblages of fossil remains does not prove that they were simultaneously deposited. He proposed to call this relationship homotaxial.

**Honan**, province, Central China, traversed by the Yellow River (Hoangho). Honan is thickly populated, especially in the part n of the Yellow River, a large fertile plain which produces all kinds of cereals. Area, 68,000 sq miles, p 25,600,000.

**Honda**, tn, Tolima, Colombia, at the head of navigation on the lower Magdalena, 60 miles northwest of Bogota. Altitude 690 ft, p 9,000.

**Hondo**. See Japan.

**Honduras**, republic of Central America, lying between the Caribbean Sea and the Gulf of Honduras on the n and Salvador and the Bay of Fonseca on the s, and between Guatemala on the w and Nicaragua on the e. Except for a narrow strip of swamp land along either coast, the country is a tableland, its series of elevated plateaus broken by broad and fertile plains and valleys, or rising to mountain-ridges that reach 8000 ft. The climate is hot on the coast but the highlands are cool and healthful. There is a wet and a dry season. The flora and fauna are those of the other Central American countries. The mineral resources are extensive, but undeveloped.

**Agriculture**—The chief export is bananas. Other products are coconuts, coffee, corn, rice, tobacco, wheat and mahogany. Cattle breeding is important and is encouraged by the government. Transportation facilities are limited. In 1941 there were 1,000 miles of railroads. There were air transport companies offering daily mail and passenger service for interior and coastal cities and to El Salvador and Nicaragua. All shipping is in a backward state. The population of Honduras

according to the 1935 census was 962,000, chiefly Spanish and mixed Spanish and Indian. Education is free and compulsory from the ages of seven to fifteen. In 1941 there were 1,600 elementary schools, with about 60,000 pupils, 15 high schools and normal schools, the National University at Tegucigalpa. Religious liberty is guaranteed, Roman Catholicism prevails. The size of the regular army was fixed at 2,500 men, including the national guard, under the terms of the Washington Central American Convention of 1923.

**Government**—The constitution was rewritten in 1924. The president is elected for six years, and is assisted by six ministers, and the legislative power is vested in a congress of deputies into the ratio of one per 15,000 inhabitants. Honduras was discovered by Columbus in 1502. With the rest of Central America, it threw off the yoke of Spain in 1821, and in 1823 joined the federation of Central American States which lasted till 1838. In 1839 it became a republic, and in 1849-51 formed a union with Salvador and Nicaragua, which ended in 1863 in war. In 1907 treaties were signed with Costa Rica, Guatemala, Nicaragua and Salvador, setting up a high court in Honduras for the settlement of all disputes between the negotiating states. Political turmoil from 1919 onwards brought intervention by U. S. Marines in 1922 and 1923. The Guatemalan boundary dispute was referred in 1930 to an Arbitration Commission presided over by U. S. Chief Justice Hughes, and settled 1933. There was considerable friction, 1939. Nicaragua claiming that Honduras had been acquiring war equipment. Honduras declared war on Germany, Italy, and Japan, 1941.

**Honduras, Gulf of**, an indentation of Central America, between British Honduras on the northwest and Guatemala and Honduras on the s.

**Hone, William** (1780-1842), a versatile and industrious English writer. The *Everyday Book*, *Table-Book*, and *Yearbook* contained rich stores of information on manners and antiquities.

**Hones**, popularly called **Whetstones** or **Oilstones**, a class of stones used for sharpening knives and other cutting instruments. See **Oilstones**.

**Honesty**, a cruciferous plant (*Lunaria annua*) which bears racemes of large scentless lilac flowers in early summer, followed by flat, elliptical pods, the central partitions of which remain until late in the winter.

**Honey**, a sweet, thick liquid produced by

bees and other insects of the same genus. The working bees gather the nectar from the nectaries of flowers, and also sweets from other sources when nectar is scarce, which they carry home to the hive in the crop or honey-bag. Here it appears to undergo a transformation, by which it becomes honey before it is disgorged into the cells of the comb. As an article of commerce and for human consumption honey is presented both in the comb and as run or strained honey. There is great variety in the quality of honey. The product of spring excels that of summer, while most

tropical bird of the family Coerebidae, found in large numbers in the West Indies.

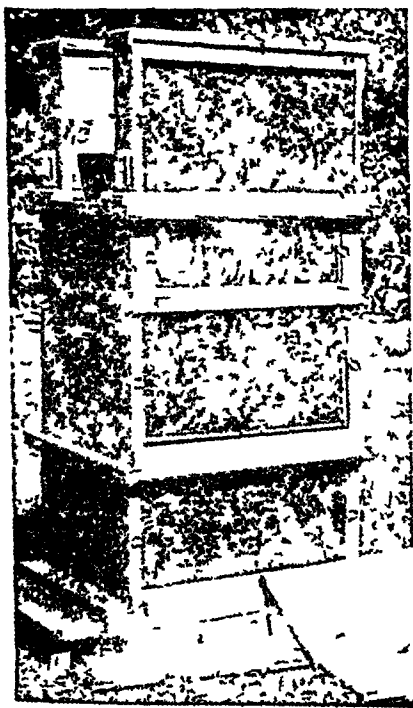
**Honeydew**, a viscid saccharine exudation which is often found in warm dry weather on the leaves and stems of plants, occurring on both trees and herbaceous plants.

**Honey Eaters or Honey Suckers** (Meliophagidae), a family of passerine birds found only in the Australian region and in some of the islands of the Pacific.

**Honey Guide, Indicator, or Moroc**, a bird of the family Indicatoridae, related to the barbets and woodpecker. They are found in Africa, India, and the Malay region. Their excitement when they have discovered a bees' nest leads a honey-loving animal like the ratel, or an observing man, to seek the nest.

**Honey Locust Tree**

**Honeystone**, or **Mellite**, a mineral which crystallizes in the tetragonal system in small, pyramidal, honey-yellow crystals, which have a waxy lustre and a hardness of about 2. It is the aluminum salt of mellitic acid, with water.



Honey. A Modern Bee Hive

autumn honey is inferior to both. The flavor depends greatly upon the flowers which have supplied the nectar. Honey is a favorite article of food. See **BEEES**.

**Honey Ant**, a small, light-colored ant of the Southwestern United States and Mexico, which lives in underground chambers.

**Honeycomb Moth** (*Galleria cerella*), a destructive moth of the family Pyralidae, whose caterpillars feed upon bee-comb and are often a great pest in hives. There are two broods in the season.

**Honey Creeper**, a small tropical or sub-



Honeysuckle

1, Part of Corolla, with stamens, 2, fruit

**Honeysuckle**, a genus (*Lonicera*) of plants of the order Caprifoliaceae, embracing some 175 ornamental shrubs, either upright or climbing, found as far as Mexico in the Western, and Java in the Eastern Hemisphere. Some 90 species and many hybrids are cultivated. The better known varieties include the bush honeysuckles *L. tatarica* and *L. fragrantissima*. Honeysuckles are easy

of cultivation and most of them are comparatively hardy. Propagation is by seeds or cuttings.

**Honfleur**, seaport and watering place, department of Calvados, France, on the southern side of the Seine estuary, 7 m se of Havre.

**Hongkong**, or **Hing-King**, a crown colony of Great Britain (area 391 sq m), made up of a compact group of islands including Hongkong Island (32 sq m), first occupied by Great Britain in 1841 and secured to her by treaty in 1842, the Kowloon Peninsula on the mainland (3 sq m), ceded to the colony in 1860, and the New Territory (356 sq m), acquired by a 99-year lease in 1898. The Island of Hongkong lies at the mouth of the Canton River. The harbor is so completely protected as to appear landlocked but lies in the typhoon belt, and severe storms occur. Hongkong is a military and naval station of first-class importance. It is one of the world's greatest transshipment ports, constituting the principal entrepôt for the trade of Southern China if not of Eastern Asia. The chief industries are refining of sugar and of tin, shipbuilding, cotton spinning, the preserving of foodstuffs, rice polishing, and the manufacture of furniture, cement, paper, rope, and woven and knitted cloth. The government of Hongkong is administered by a governor, assisted by an executive council of nine members, and a legislative council. The total civil population of the colony in 1941 was 1,052,256. The colony was seized by Japan, 1941, restored, 1945.

**Hongkong University**, an institution of higher learning on the island of Hongkong, opened in 1912. The University is under the control of the government of the island.

**Honolulu**, capital of the Hawaiian Islands, is situated on the southern coast of the Island of Oahu. The city stretches for several miles along the shore between the sea and the mountains. There are beautiful drives, parks and playgrounds, the largest being Kapiolani Park. Waikiki Beach, s of the city, is a world-famed resort, noted for its surf boating. The United States Army and Navy occupy a conspicuous part in the city's life, owing to its nearness to Pearl Harbor (naval station) and Schofield Barracks (military post). Honolulu is a distributing center for the whole island. The chief exports are sugar and pineapples, a large quantity shipped to the U S. The population is heterogeneous, including Japanese, Chinese, Americans, Portuguese, English, and Germans, as well as

native Hawaiians. The attack on Honolulu and Pearl Harbor Dec 7, 1941, resulted in America's entry into World War II.

The harbor of Honolulu was made known to civilization by Captain Brown (1794), but the place remained a mere village until 1815. In 1820 it became the capital of the archipelago, and remained the territorial capital after the Hawaiian Islands were annexed to the United States, p 154,476.

**Honorius** (384-423 AD) or, in full, **Flavius Honorius Augustus**, emperor of Rome from 395, was the second son of Theodosius the Great. His reign is noteworthy chiefly for the inroads of the Goths, under Alaric, and under Rhadagaisus. The former was checked and the latter defeated by Stilicho, who was the real ruler of the empire during Honorius' youth.

**Honorius I, Pope** (626-638), was born in Campania. He sent the pallium to Paulinus of York and Honorius of Canterbury, and tried unsuccessfully to make the British church adopt the Roman custom of keeping Easter.

**Honorius II, Pope** (1124-30), Lambert of Ostia, was born in Fagnano near Imola. He sanctioned the order of Knights Templars (1128) and the Præmonstratensian order, sent Otho as missionary to Poland, and contended unsuccessfully with Roger, Count of Sicily, over the Norman possessions in Southern Italy.

**Honorius III, Pope** (1216-27), Cencio Savelli, born at Rome. He confirmed the order of St Dominic (1216) and of St Francis (1223), crowned Frederick II emperor, opposed the Albigenses, and supported Henry III of England against France.

**Honorius IV, Pope** (1285-7), Giacomo Savelli, born at Rome, supported Charles of Anjou against Peter of Aragon, who had taken Sicily and imprisoned the king.

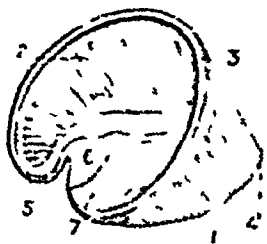
**Hood, Thomas** (1799-1845), English poet, was born in London. In 1821 he became sub-editor of the *London Magazine*, to it he contributed verse, and through it he became the friend of Lamb. His wit and humor were more lucrative to this brave struggler than the qualities with which they were inseparably blended. His *Miss Kilmansegg* is rightly classed among his serious poems, and with the pathos of *The Song of the Shirt* and *The Bridge of Sighs* he stirred all hearts.

**Hood, Mount**, summit in the Cascade Range in Oregon, is an extinct volcano rising to 11,225 ft above the sea.

**Hooded Warbler** (*Wilsonia mitrata*) one

of the most conspicuous of the warblers of the United States, spending the summer in the Southern and Middle States.

**Hoofs** are the solid envelopes which, in the majority of ungulates, encase the extremities of the digits and replace the nails or claws of other mammals. Like nails they are renewed behind as they are gradually worn away in front. They are shed from dead antlers and utilized for the production of glue, gelatin, etc.



*Hoof*

- 1 Horn (all or crust) (hoof horn) 2 Inner layer of horn fibrous horn (insensitive) turn 3 3 Coronal band (peripole) 4 The toe 5 The heel 6 The frog 7 The bar

**Hook of Holland**, or **Hook-van Holland**, the point of a small peninsula of S. Holland, at mouth of the New Waterway, 17 m. W. of Rotterdam.

**Hookah**, the *corbille* of India and Persia, an Oriental tobacco pipe, having the bowl attached to a pipe containing water, through which the smoke passes before entering a long, flexible tube conveying it to the mouth-piece.

**Hooke, Robert** (1635-1703) English experimental philosopher, born at Freshwater, Isle of Wight. He divined before Newton the true doctrine of universal gravitation, but from his lack of mathematical knowledge failed to demonstrate his discovery.

**Hooker, Mount**, peak of the Rocky Mts., on the boundary between British Columbia and Alberta, Canada.

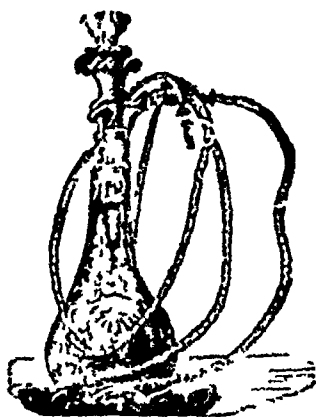
**Hooker, Thomas** (1586-1637), American theologian, one of the founders of Connecticut, was born in Marlfield, Leicestershire, England. Having been arraigned as a Puritan by the ecclesiastical authorities in England, he went to Holland in 1630 and from there emigrated to New England in 1633 where he became pastor of the first church at Newtowne (now Cambridge), Mass. Becoming discon-

tented with conditions in Massachusetts he led his congregation and others to what is now Connecticut, and there founded Hartford.

**Hookworm Disease**, known technically as *Uncinariasis* and *Trichostrongylosis*, and popularly as Ground Itch, Anemia, Miners' Anemia, Bricklayers' Anemia, and Lymphatic Chlorosis is a parasitic disease occurring principally in tropical and subtropical countries. In the United States it is confined chiefly to the river valleys of the South Atlantic and Gulf States. It attracts persons of all ages and classes though it is most common in rural districts.

**Symptoms**—Infections of cutaneous origin, which appear to constitute the great majority of cases, two distinct stages in the course of the disease may be recognized—the cutaneous and the intestinal. The characteristic feature of the cutaneous stage is the itching at the site of entrance of the young parasite.

The symptoms of the intestinal stage are anemia. Because of its baneful effects on the health and efficiency of the rural population, the hookworm constitutes a serious menace to economic and social progress. The State board of health have conducted vigorous campaigns against the disease, and the Rockefeller Commission for the Eradication of Hookworm Disease has accomplished important results.



*Hookah*

**Hoop Snake**, the name given to *Abaster erythrogrammus* and *Tarantula abacura*, two small harmless snakes found in the Southern United States.

**Hoosac Mountains**, in Berkshire co., Massachusetts, a spur of the Green Mountains.

The **Hoosac Tunnel**, the first great tunnel in the United States, pierces the Hoosac

Mountains near North Adams It is about  $4\frac{1}{4}$  m long, and was constructed in 1856-73 at a cost of \$20,000,000

**Hoosac River**, or **Hoosick River**, rises in Berkshire co, Massachusetts, flows through Vermont and New York, and after a course of about 90 m joins the Hudson River 15 m north of Troy

**Hoover, Herbert Clark** (1874- ), the thirty-first president of the United States, was born in West Branch, Ia His parents were Quakers and his father died when he was four years old and his mother when he was ten He entered Leland Stanford Junior University, worked his way through and was gradu-

ated in 1895, a brilliant student in mathematics and engineering In 1898 he married Miss Lou Henry of Monterey, Cal He served on various government expeditions which mapped water, mineral and forest resources

He made a big reputation for himself in a short time, and before he was twenty-four he was engaged by a British firm to work in Western Australia, where gold had been discovered His own fame spread, so that he received other foreign offers and accepted the appointment of Director of the Department of Mines under the old Imperial government of China



*View of Hong Kong*

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He was in the foreign quarter of Tientsin when the Boxers rose His house was under a bomb and rifle bombardment for a month Mr Hoover did his first relief work here, distributing the supplies to the Chinese refugees during the siege In 1907 he set up independently as a mining and engineering expert He planned mines and built railways and smelters in Burma He opened copper mines in the Ural Mountains and supervised great mining and industrial developments in the

United States, Mexico, Alaska and Australia For some years before World War I his headquarters were in London, although his work took him to nearly all parts of the world After the outbreak of the World War I (1914), he acted as organizer and chairman of the American Commission for Relief in Belgium On Aug 10, 1917, he was appointed by President Wilson as National Food Administrator He later became head of the Supreme Economic Council at Paris In 1921 he was appointed Secretary of Commerce in President Harding's cabinet, continuing in the same office under President Coolidge In 1928 Mr Hoover was the Republican choice

for President of the United States and he was elected by a popular majority of about 6,000,000 and a majority of 357 electoral votes He was defeated for re-election in 1932 by Franklin D Roosevelt, his administration having been beset by the business depression which began in 1929

In 1938 Mr Hoover visited 15 European countries After his return he wrote, with Hugh Gibson, *The Problems of Lasting Peace* (1942) See U S HISTORY

**Hoover, John Edgar** (1895- ), public official, since 1933 director of Bureau of Investigation of the United States Department of Justice He is also Major of the Military Intelligence Division Reserve, and Vice-chairman of the Advisory Board of International World Police Mr Hoover was trained to be a lawyer and criminologist Among his best known activities was the capture of the notorious criminal John Dillinger in 1934, when Dillinger was killed and his gang broken up See KIDNAPING

**Hope, Anthony**, pseudonym of Sir Anthony Hope Hawkins (1863-1933), English



*Photo Underwood & Underwood*

*HERBERT C HOOVER, Thirty-first President of the United States*



novelist, was born in London and was educated at Oxford. In 1894 appeared his two great successes, *The Prisoner of Zenda* and *The Dolly Dialogues*, examples of widely different styles. Subsequent works are *Simon Dale*, *Rupert of Hentzau* (1898), *The King's Mirror* (1899), *Lucinda* (1920).

**Hopedale**, town, Massachusetts, in Worcester co. It was founded in 1841 as a religious community, the aim of its founder, Adin Ballou, having been to restore the ideals of Christian life, but the venture was not a financial success and social harmony could not be maintained, p. 3,113.

**Hopkins, Edward** (1600-57), governor of Connecticut in alternate years from 1640 to 1652. The union of the New England colonies (1643) is largely due to him.

**Hopkins, Harry L.** (1890-1946), public official, was born in Sioux City, Ia., educated at Grinnell College. He engaged in social service work in N. Y. City, in 1912, was director of the N. Y. State Temporary Emer-



Harry L. Hopkins

gency Administration in 1931, Federal Administrator of Emergency Relief, in 1933, Secretary of Commerce, 1938-40. In 1941 he made two visits to London as the President's messenger and flew to Moscow to confer with Marshal Stalin. In the same year he served

for 5 months as Lend-Lease Coordinator. In 1943 he became head of the Russian Protocol Committee and was appointed to the advisory committee of the Office of War Mobilization. He was the President's adviser at the Casablanca, Quebec, Cairo, and Teheran conferences. In 1945 he was awarded the Distinguished Service Medal for 'exceptional ability in welding our allies to the common purpose of victory over aggression'.

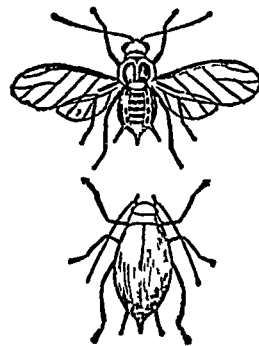
**Hopkins, Johns** (1795-1873), American financier and philanthropist, was born in Anne Arundel co., Maryland. In 1873 he made a gift of property worth \$4,500,000 to found a free hospital, he presented Baltimore with a public park, and he gave more than \$3,000,000 to found Johns Hopkins University in Baltimore.

**Hopkins, Stephen** (1707-85), colonial governor of Rhode Island, and a signer of the Declaration of Independence. He was a member of the colonial assembly in 1732-1741, chief justice of the Superior Court in 1751-4, delegate to the Colonial Congress which assembled in Albany in 1754, and nine times governor of Rhode Island. In 1774-8 he was delegate to the Continental Congress.

**Hopkinson, Francis** (1737-91), American lawyer and legislator, was a delegate from N. J. to the Continental Congress in 1776-77.

**Hopkinson, Joseph** (1770-1842), American jurist. He was author of the national song *Hail Columbia* (1798).

**Hop-louse**, a species of *Aphis* (*Aphis humuli*) which in certain seasons works fearful havoc in the hop fields.



Hop-fly—Insect and Larva

**Hopper, De Wolfe**, (1858-1935), actor born in New York City. He made his debut in *Our Boys* in 1879. He has played with Student Prince Co. and the White Lilacs Co. He made a lecture and concert tour in

1930-31, and gave radio talks in 1932 and later. In 1933 he toured with a company playing *Uncle Tom's Cabin*.

**Hops** (*Humulus lupulus*) belong to the same natural order (Urticaceæ) as hemp and the common nettle. The hop (*H. lupulus*) is a beautiful climbing plant, native to America and the Old World, cultivated for the sake of the catkins, which contain a bitter principle (lu-



**Hops** (*Humulus lupulus*)

1 Female inflorescence, 2 male inflorescence, 3 male flower, 4 female flower with scale, 5 fruit (seed), 6 fruit (seed) with scale, 7 section.

pulus), and are used in brewing for imparting an agreeable flavor to beer. The best hops are grown in Kent, England, and in Bohemia, New York and the Pacific States supply most of those grown in America.

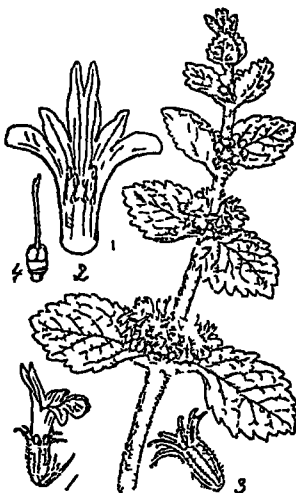
**Hor**, 'Aaron's Mount', mt. of Arabia, is the reputed scene of Aaron's death. The structure on the summit is said to mark his tomb.

**Horace** (65-8 B.C.), Roman poet, whose full name was Quintus Horatius Flaccus, was born near Venusia in Apulia. He was not by race of Roman blood, but was educated at Rome and at Athens. His writings include four books of *Odes*, lyrical poems on a variety of subjects, one book of *Epodes*—iambics he calls them himself i.e. lampoons of a bitter

and sometimes coarse description, two books of *Satires*, which, on the whole, are not violent or severe, but rather caustic and witty sketches of the character and manners of the times, two books of *Epistles*, which are similar to the *Satires*, but wider in their choice of subjects, and even more good-humored in their tone, and the *Ars Poetica*, a letter to a young friend, dissuading him from attempting poetry, while giving advice on the subject. He is the poet of the man of the world in the better sense of that phrase, and many a Horatian phrase has become proverbial.

**Horæ** (i.e. the Seasons), in ancient Greek mythology, were daughters of Zeus and Themis, goddesses who regulated the order of nature, guarded the doors of heaven, and promoted the fertility of the earth by their control of the weather.

**Horatius**, three brothers of the Horatian clan in ancient Rome, who fought with three Curia from Alba to decide whether Rome or Alba should rule the Latin league. One of Corneille's great tragedies, *Horace*, deals with this subject.



**Horehound**

1, Flower, 2, Corolla, laid open, 3, calyx, 4, pistil

**Horatius Cocles**, on the occasion of Por-sena's attack on Rome, about 508 B.C., is said to have held (with two others) the Sublucian bridge against the whole Etruscan army, while the bridge was being broken down. He then sprang into the Tiber, and swam ashore. The story forms the subject of one of Macaulay's *Lays of Ancient Rome*.

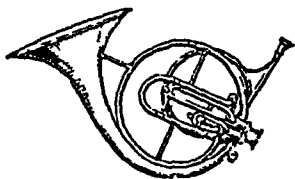
**Horeb, Mount**, in the Old Testament an alternative name of Mount Sinai

**Horehound**, a term applied to two plants belonging to different genera of the mint family. White horehound (*Marrubium vulgare*) is the aromatic, bitter herb highly reputed in domestic medicine. Both are European plants naturalized in America.

**Horizon**, the great circle of the celestial sphere of which the zenith and nadir are the poles.

**Horn, Cape**, the southernmost point of S America, in lat 55° 59' S, a desolate rock, rising to a height of 1,390 ft. The surrounding region is stormy, and dreaded by sailors.

**Horn, French** (Fr *cor*, *cor de chasse*), a brass wind-instrument which possesses a peculiar tender and mellow tone. Originally its use was confined to the hunting field, but about the beginning of the 18th century it was introduced into the orchestra.



French Horn

**Horn, Arvid Bernhard, Count** (1664-1742), Swedish statesman, born at Vuoren-taka in Finland. In 1710 he was appointed chancellor, and from 1719 to 1738 (at which latter date he was ousted by the *Hats*) he practically ruled Sweden, introducing a liberal constitution which converted the most autocratic into a very limited monarchy.

**Hornaday, William Temple** (1854-1937), zoologist, was born in Plunfield, Ind. He was collecting naturalist for American museums, 1875-82, chief taxidermist U S National Museum, 1882-8, Director N Y Zoological Park, 1896-1926. He has won many medals for his work in bird protection. Among his works are *Tales from Nature's Wonderlands* (1925), *Thirty Years War for Wild Life* (1931).

**Hornbeam** (*Carpinus Caroliniana*). The American hornbeam, or blue- or water-beech, resembles the European *C. betulus*, formerly used abroad in topiary gardening. It is a small tree, forming a compact, round head with ovate leaves, doubly serrate, and a profusion of fertile aments, at the ends of twigs, which after maturity persist far into the winter. Each hard ovoid nut lies at the base of a

wing-like incised bract, forming a long drooping raceme. The bark is gray, very smooth, and close-fitting. The wood is light brown, hard, strong, and durable.



Hornbeam

1, Bract of male catkin, 2, flower of female catkin, 3, nut with scale, 4, ovary.

**Hornbills**, interesting birds, widely distributed in the warmer parts of the Old World, constituting the family Bucerotidae, and characterized by the greatly developed bill, which is surmounted by a bony excrescence, the 'helmet'.

**Hornblende** is an aluminous variety of amphibole quite common in crystalline rocks, generally black in color, but sometimes green or dark brown, sp gr 3.0, h = 5.5. The term hornblende is commonly used in petrography as a generic name for the whole series of monoclinic amphiboles.

**Hornbook**, formerly used by children in learning to read, consisted of a tablet of wood on which was a piece of paper or parchment usually containing the alphabet, the nine digits, and the Lord's Prayer, the paper was protected by a thin layer of transparent horn, whence the name 'hornbook'. A projection of part of the wood formed a handle.

**Horne, Richard Henry**, or Hengist (1803-84), English author, born in London, carried on a correspondence with Mrs Browning, then Miss Barrett, and in 1843 published *Orion*, an epic poem.

**Horne, Thomas Hartwell** (1780-1862), English biblical critic, born in Chancery Lane, London.

**Horned Frog** (*Ceratophrys*), a large, vari-

colored frog with a triangular appendage on the eye-lid. About ten species are found in South America.



*Horned Frog*

**Horned Screamer** (*Palamedea cornuta*), a South American forest bird of a glossy black color, with white on the head, wings, and abdomen. The head bears a long, slender horn.

**Horned Toad**, any of many species of small, squat, short-tailed, earth-colored lizards, mostly of the genus *Phrynosoma*, and allied to iguanas, which inhabit the arid s w of the United States, and the plains of Mexico.

**Horned Viper** (*Cerastes cornutus*), a poisonous snake (viper) found in N E Africa, remarkable in that it has a projecting horn-like scale above each eye.

**Hornell** (formerly Hornellsville), city, Steuben co, N Y, 70 m s e of Buffalo. It is an important railroad center, being a junction of three branches of the Erie Railroad. Large repair shops are situated here. The leading industries embrace the manufacture of doors, sashes, carved panels, desks, etc., silks, broad goods, silk gloves, shoes, electrical goods, coffee mills, and vitrified brick. The city is the centre of a large agricultural trade. The city has the reputation of being one of the pleasantest residential places of the state. The valley was the Indian highway between the Genesee and Susquehanna valleys. Hornell was first settled in 1790 and became a city in 1888, p 15,494.

**Hornet** (*Vespa crabro*), a common European species of social wasp, distinguished by its large size and bright red-brown markings. This wasp has been introduced into the United States near New York, and there is a native American species (*V. maculata*) of similar habits, which builds a very large pear-shaped paper nest in trees.

**Hornfly**, a European biting fly (*Hæmatobia serrata*) now becoming prevalent in the United States, which worries cattle greatly.

**Horns**, as typically represented in the hollow-horned ruminants, are unbranched sheaths placed upon the top of cores of bone developed from the frontal bones of the skull,

and are exemplified in oxen, sheep, and antelopes. They differ from antlers, not only in the horny sheath, but in the fact that neither core nor sheath is shed throughout life. In some cases, as in the majority of antelopes, horns are confined to the male sex, in others they occur in both sexes. Functionally they are weapons, and can often be used with the most deadly effect. They are utilized in many ways, as handles, ornaments, etc.

**Hornstone**, a compact, flinty variety of chalcedony, rather more brittle than flint but much resembling it in color and texture.

**Horn-tail**, any of various insects related to the saw flies which injure trees by boring holes into the new wood beneath the bark.

**Horologium**, the Clock, a southern constellation placed by Lacaille in 1752 between Dorado and Eridanus.

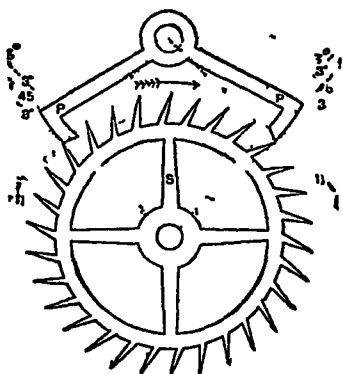
**Horology** is the science of measuring time, and of the constructive principles of machines for this purpose. The sundial is the earliest instrument of this kind, and the first advance upon it is said to be due to Plato, who invented the clepsydra, or water-clock. King Alfred, in the 9th century, used graduated candles, the burning of which marked the passage of time. Sand-glasses also were used from an early date, and are common even now.

The sun 'transits' or crosses the meridian at twelve noon, and the interval between two consecutive transits of the sun is a solar day. The earth makes its revolutions in almost uniform time, but it also travels round the sun, and its rate of motion in this path varies, also the inclination of its axis to the sun is constantly changing, it therefore follows that no two solar days are of exactly the same length. As it would be impossible to be always changing our clocks at noon to agree with the daily transits of the sun, an average of all the transits of the sun in the year is taken, and this is known as mean time. The difference between the actual transit of the sun and the average or mean time is called the equation of time, and tables giving the times of the actual transits of the sun and also of the fixed stars during the year are prepared at the national observatories at Greenwich and Washington. As one degree is the 360th part of the earth's circumference, and as the earth revolves once in twenty-four hours, it follows that four minutes of time must be allowed for every degree.

**Clocks**—The art of clock and watch making, it is thought, first took practical shape in Germany, and there is positive proof that, about 1364 Charles V of France summoned

one Henry de Vick from that country, commanding him to make and fit up a large turret clock at his palace in Paris. De Vick's clock was regulated by a balance, the pendulum not having been yet invented. The escapement is that part in a clock or watch which prevents its running down too quickly. It consists of the last and quickest moving wheel in the train, along with the pallets which communicate the energy to the pendulum or balance. A train consists of a number of wheels which gear together. In a timepiece, the force, generated either by weight or spring, is transmitted by the train to the escapement, and in a clock there is also an additional train, for the purpose of making it strike the hours.

For upwards of two hundred and fifty years this escapement, with its rule method of regulation, remained without advance, until Galileo discovered the pendulum. Although he conceived the idea of applying a pendulum to a clock, it was left to Huyghens, the Dutch philosopher, to perfect it. The same escapement remained in use, but the escape wheel was now placed vertical to the other wheels, and the power was transmitted to it by means of a contrate wheel—*i. e.* a wheel where the teeth project from the side of the rim instead of lying in the same plane.



*Dead-beat Escapement*

Towards the end of the 17th century, George Graham produced his *dead-beat* escapement, which is the one now used in high-class timekeepers. When a tooth in the escape wheel has given its impulse to the one pallet, the other pallet receives a tooth and stops the wheel, but, owing to the face of the pallet being concentric with the arbor, to which it is fixed, the wheel is not driven back, but locked, and it remains stationary until the next forward movement. This gives the name of *dead-beat*.

Sixty years ago, Alexander Bain was the first in Great Britain to use electricity in connection with clockwork. Electricity is generally used in three ways—(1) to control clocks at a distance from a standard clock, (2) to bring the different clocks in a circuit to the same time, usually at the end of each hour, and (3) as the motive-power. Compressed air has in recent years been used to move dials, which are simply time indicators, the air being forced along pipes at intervals, controlled by a standard clock. In a very large clock with four dials, in the tower of the Philadelphia, Pa., City Hall, compressed air is the power used for driving the hands, and the motion is controlled by a small clock inside the tower.

Wireless telegraphy is also employed in synchronizing clocks, and extensive experiments are being made to that end in Europe. By this method a relay can be operated at each station in unison with the master clock, while it is also possible to send exact noon signals as is done by the United States Naval Observatory.

It is believed that early horological machines had no striking part. The first step in this direction was an alarm-striking apparatus, and afterward a hammer was made to strike a bell a certain number of times, according to the hour. A more modern and improved device is the hour rack. This is the segment of a circle with twelve teeth cut in the edge. From the center of motion of this piece a small lever projects, which falls into steps of a relative depth on the edge of a snail which is fixed to the hour wheel. The clock in striking gathers up the rack by a pallet, which is fixed to a wheel, which makes one revolution for every blow struck. Bells are most commonly used to make the hours audible, but there are other means, such as gongs, which are simply coiled wires, and give out a softer and more mellow tone. The most recent contrivance is a steel tube of such diameter and length as will give the desired pitch. In a chiming clock an extra train of wheels is necessary for that purpose. The chimes are generally struck on eight or ten bells, and in clocks with the tubes there is always the full octave, with an extra long and large tube for the hours.

*Watches*—When watches were first made is unknown, but it is supposed to have been shortly after the invention of the mainspring. The escapement used was the verge, similar to the one used in clocks, but instead of an arm with weights there was a wheel equal in weight all round—*viz.*, the balance wheel, which is used to this day. In the earlier

watches catgut was used instead of chains for conveying the force of the mainspring to the fusee. The gut was fastened at one end, in the edge of the box containing the mainspring, and was passed round this box several times. The other end of the gut was fastened to the fusee at its largest diameter. On the key being put on the fusee square and turned, the gut was wound round the fusee. These watches had no balance spring, but depended for their regulation on a contrivance which consisted of an endless screw and small wheel attached to the mainspring arbor. This, on being wound up or let down, caused the watch to go respectively quicker or slower.

Hooke invented (c 1660) the balance spring, and on this being applied to watches, they were found to go so much better that a minute hand was added, and the hour divided into sixty minutes. Graham, already mentioned, applied his dead-beat clock escapement to watches in what is called the cylinder escapement. This escapement is still largely used for cheap Swiss watches, and gives good results.

The lever escapement—decidedly the most useful of all the escapements ever applied to watches—is the one now most generally in use. For ordinary purposes, it has proved itself to be superior even to the chronometer.

The chronometer escapement is the one applied to the best class of portable timekeepers, such as are used by astronomers, naval and scientific men. While simple in its action, it does not admit of any but the finest workmanship. About the middle of the 19th century it was much in favor for pocket watches, but from its great delicacy, and the necessity for the most careful treatment, it was rapidly displaced for this purpose by the lever.

See the following standard works: Sir Edmund Beckett's *Clocks and Watches and Bells* (8th ed 1903), Benson's *Time and Time Tellers* (2d ed 1902), David Glasgow's *Watch and Clock Making* (1885), F J Britten's *Watch and Clock Maker's Handbook* (1892), Hood's *Modern Methods in Horology* (1944).

**Horr, Roswell G** (1830-96), American political leader and journalist, was born at Watfield, Vt., and went to Lorain co, O., when he was four years old. He graduated with the first class from Antioch College in 1857, and was admitted to the bar after being clerk of the Common Pleas Court for six years. In 1866 he went to southeastern Mo., where he was interested in mining for six years, and then settled in East Saginaw, Mich., whence he was elected Republican rep-

resentative to the 46th, 47th, and 48th Congresses. After his retirement he was associate editor of the *New York Tribune*. He became widely known as a political speaker, especially during the campaigns of 1884, 1888, 1892, and 1896.

**Horrocks, Jeremiah** (1617-41), English astronomer, born at Toxteth, near Liverpool, was the first observer of the transit of Venus, described in *Venus in Sole Visa, Anno 1639*, published in Germany in 1662. In 1678 the Royal Society published *Jeremæ Horroccii Opera Posthuma*.

**Horse** (*Equus caballus*), a highly specialized member of the order Ungulata. In domesticated forms the color varies very much but stripes rarely occur. The height of some domesticated forms, which may reach 5½ feet, greatly exceeds that of any wild member of the family.

While the majority of mammals have their limbs terminating in four or five digits, the horse alone has but one toe on each foot. This toe has a greatly developed nail or hoof, on which the animal walks, and is the middle digit of the typical extremity. The skeleton of the horse shows many striking peculiarities, which combine to give the animal its characteristic strength and swiftness. The skull is very long, the length being especially due to the facial portion, which not only carries the six large functional cheek-teeth, but has also a considerable space or diastema separating these teeth from the front teeth. It is in this space that the bit is placed. The orbit or socket for the eye is completely surrounded by bone, and the nasal cavities are large. The bodies of the cervical vertebræ form ball-and-socket joints, and so help to give its great mobility to the elongated neck. The incisors of each jaw are in very close contact, and have broad crowns. Each contains a deep pit formed of enamel, which is partially filled with cement. This, a unique structure among living mammals, constitutes, as the tooth begins to wear, the so-called 'mark,' by means of which it is possible to tell approximately the age of the animal. The pit does not extend to the bottom of the tooth, and is obliterated by wear when the horse has attained a certain age.

In the wild or semi-wild states horses live in large droves, headed by an old stallion. They are essentially inhabitants of open country, and feed entirely upon the herbage of the plains. In its wild state the true horse appears to have been confined to the steppe country of Europe and Asia, and was probably

domesticated in Europe by the men of the Stone Age. The only true wild horse known, as distinguished from domestic breeds which have reverted to a wild state, is Pezevalsky's—a small, compact animal existing in herds on the elevated plains of western Tibet.

To the horse family, Equidæ, belong, in addition to the true horses, the asses, zebras, and quaggas. The existing members of the Equidæ show their high specialization, notably in the fact that the limbs terminate only in a single toe, and that the teeth display great complexity.

As yet no adequate explanation of the absence of the horse from America in the historic period has been offered, but it should be noticed that the problem does not stand alone, for while ungulates were in geologically recent times abundant in South America, at the time of the Spanish conquest very few species were found living there. The absence from Australia presents no special difficulty, for placental mammals in general are absent from that region.

Among horses the aristocrat is the Thoroughbred or race horse. The Thoroughbred race horse has for a hundred years been kept pure, it originated in England and owes much to an Arab strain. The classification of breeds is a complicated question not fully agreed upon by horse lovers. In general, the chief groups, are draught, harness, saddle. The hunter is considered a type, bred with one thoroughbred parent, for gait, comfort and speed. Among draught horses the Flemish horse or Belgian heavy horse, the charger of the Middle Ages, is famous. The modern Belgian is very heavy and strong. There are also the Shire, Clydesdale, Suffolk, and Percheron, all of which contain Flemish blood. Harness breeds consist of the Hackney, bred for weight and style and formerly conspicuous for its docked tail, and the American Standard, a lighter build bred to pace or trot.

The American trotter is a peculiarly native institution. He is purely a trotting thoroughbred. The American saddle horse has its finest illustration in the Kentucky gaited horse, with at least five gaits, tracing his ancestry back to the great saddle horse of the early sixties, Denmark. The Kentucky horse has a large percentage of thoroughbred blood with the trotter welded in. He is broken to walk, trot, singlefoot, canter, and gallop, and sometimes to other gaits. His admirers and defenders are legion, and his long line of ancestry shows plainly in his character. Other famous saddle horses are the Barb, Turk, and Cossack, the

English hunter, and the Arab. Various ponies as the Welsh, Shetland, and New Forest, are considered saddle horses. The famous Morgan horse is supposed to have Arab blood.

**DISEASES**—Equine diseases may be roughly grouped into four main classes—(1) bacterial diseases, (2) organic diseases, (3) diseases of the organs of locomotion, (4) parasitic diseases.

Bacterial diseases include all the contagious and infectious disorders of the horse, such as strangles, glanders, farcy, influenza, or pink-eye, equine contagious pleuro-pneumonia, tuberculosis, and certain non-contagious diseases, including anthrax, tetanus, purpura-hæmorrhagica, malignant œdema, septicæmia, and pyæmia.

Strangles (so-called from the difficulty in breathing it often produces) is a common and widely-spread disorder peculiar to horses, asses, and mules. It exhibits itself chiefly as an infectious catarrh of the mucous membrane lining the upper air passages, accompanied, as a rule, by swelling and suppuration of the lymph glands in the region of the throat.

The organs of respiration suffer from catarrh, laryngitis, pneumonia, pleurisy, bronchitis, roaring, whistling, and broken wind. Roaring in horses is an abnormally loud, coarse sound, heard in respiration when the animal is exerted. It is caused by paralysis of the muscles of the larynx, generally affecting those on the left side of the neck. Lameness is very common in horses, and is due to a great variety of diseased conditions. The larvæ of the gad-fly (*Æstrus equi*) are found attached to the stomach of the horse, and known as 'bots,' while ascarides and other round worms inhabit the intestines. Three varieties of mange insects attack the skin of the horse.

**Horse-chestnut** (*Æsculus Hippocastanum*) is one of the handsomest of cultivated trees, and a native of Central Asia. Its leaves are large and fan-shaped, each consisting of five or seven long serrated leaflets. A characteristic feature consists in the large thickened buds and branch ends.

**Horse-fly**, any of the gadflies of the family Tabanidæ. See GAD-FLY.

**Horsehair Worm**. See Gordius.

**Horse Latitudes**. The ill-defined tropical belts of high barometric pressure at latitudes 30° N and S, on the outer margins of the trades, are known as the horse latitudes, or areas of tropical calms.

**Horse-mackerel**, a member of the pompano family Cyprinidæ, which includes a large

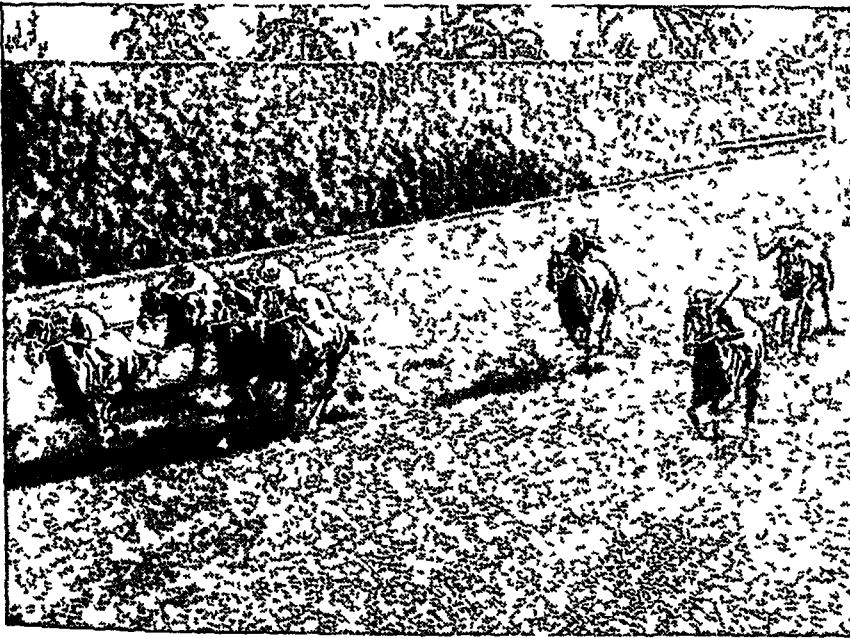
number of powerful predatory marine fish, useful as food, and widely distributed over the oceans of the world

**Horsens**, seapt, Jutland, Denmark. The old Grey Friars' church has many remarkable monuments. The chief industries are weaving, iron-working, and shipbuilding, p 28,135

**Horse-power** When a force is exerted against a resistance so that motion results, as when a weight is lifted or a spring compressed, work is done to an extent equal to the product of the force into the distance through which it has been exerted, the customary mechanical

the race-horse made his appearance in America, the English horse Bulle Rock, foaled in 1718, being imported into Virginia by Samuel Patton and Samuel Gist, and beginning the era of the many race horses which were to make their names felt in the early history of the colonies

The first race meetings in America were given in Virginia in 1753, and the first regular racing organization was formed at Charleston, S C, in February, at a course which had been built by a Mr Nightingale and was called the Newmarket Course. At about the



*A Horse Race, on Race Track*

unit in English-speaking countries being the weight of a pound lifted a foot, or 1 foot-pound. The amount of work is independent of the time it takes, but the power of the system exerting it is inversely proportional to this factor—the shorter the time in which the work is done the greater the power, thus, the unit, or horse-power, is such a power as can lift 33,000 lbs 1 ft in 1 minute

**Horse racing** There were trials of speed and endurance between horses centuries before the Christian era, but the animals were driven in chariots. But the sport, as we know it did not become popular until its rise in Britain during the reign of James I. It was later in the reign of George II, in 1730, that

same time there were the Newmarket, Tree-Hill, Broad Rock, and Fairview courses in Virginia. All of them were the center of social life, Gen Washington acting as judge at one of the Newmarket meetings. By the time of the Revolution the breeding of race horses had progressed so far that stud farms were in existence from Long Island to the Carolinas and many horses were bred and raced. During the war little was done, but after the surrender of Cornwallis the turf again began to flourish, but it was not until 1815 that the race meetings of America were conducted on anything like systematic plans.

Since that time the records have been regularly kept and are authentic. Prior to that



time the records are fugitive and cannot be used as an authentic history of the American turf. The first thoroughbreds imported into the North were the horses Wildair and Lath and the Cub Mare and Rachel, landed at the Battery in New York city between 1755 and 1760, and to the Cub Mare many high class racers of today can trace their ancestry. The first races North were held on Long Island in 1819, and in 1821 the famous Union Course was laid out there. Kentucky began the breeding of race horses in 1795 and Tennessee in 1800, and soon after they were rivalling the older states. As the years went on Kentucky firmly established herself at the head of the states in this respect and has a fair show of right in still claiming the honor. The great Man o' War (1917- ) of Faraway Farm, who was retired in 1920, came from the blue grass region of Kentucky, and there are few who are not willing to accord him the palm as the greatest race horse ever bred in this country. During the Civil War racing in the South was paralyzed, although occasional meets were held, and it has never resumed its position. In the very heart of the war, in 1863, the North took up racing in earnest and Saratoga's famous track was opened for the first time, Jerome Park followed in 1866 and then in the following years Monmouth Park, N. J., Brighton Beach, Sheepsherd Bay, Brooklyn, Morris Park, Aqueduct, Jamaica, and finally in 1905 the magnificent Belmont Park on Long Island, built to succeed Morris Park, which had taken the place of the abandoned Jerome Park. Now the chief tracks north of Washington are in Md, N. Y., R. I., Mass., and N. H.

The governing body of the sport in America is of comparatively recent origin. It began with the Board of Control, which held sway for several years and was then succeeded by the Jockey Club, which now exercises control over all the tracks in the North and East, while in the West and South the Western Jockey Club is director of the sport.

Racing nowadays is conducted like a great business enterprise. Conditions are framed to suit all sorts and conditions of race horses, and each is supposed to have at least one chance in a season to win. The racing rules are stringent. They provide for all sorts of emergencies, and a member of the Jockey Club is in the stewards' stand at every race track to see that they are enforced. Jockeys and trainers cannot exercise their vocations unless licensed by the Jockey Club, and the forfeit list controls the owners, who cannot

start a horse in a race if there are any charges of any jockey club against him.

With the increased liberalization of legalized pari-mutuel betting, racing activities have become much more numerous and profitable in recent years. Pari-mutuel betting—a mathematical system whereby the odds are determined by the bettors themselves—has been legalized in a number of states and bills are pending in several additional legislatures. Pari-mutuel betting is handled mainly through machines known as "totalizators." Despite the continuance of the depression, horse-racing has been growing in magnitude over the past few years. Stakes and purses distributed in the United States in 1940 amounted to approximately \$20,000,000; there were over 16,000 races run and over 12,000 horses participated in races. States in which horse-racing is permitted receive considerable revenue from the tracks. Races are held at different seasons on different tracks, so that there is horse-racing at any time of year somewhere in the United States.

The total number of horses on farms in the United States has declined very noticeably in the past ten years to a figure estimated by the Department of Agriculture to be approximately 10,600,000 in 1940, exclusive of horses in cities, towns and elsewhere. It is believed that there are upward of 50,000 thoroughbreds in the U. S.

**Horse-radish**, a cruciferous plant cultivated in Europe, but in America a garden-escape frequent in moist lands. The root, which has a hot, piquant, mustard-like taste, is grated as a condiment eaten with meats.

**Horseshoeing**, the fitting of iron shoes as protection for the horse's foot. The shoe is built to conform precisely to the natural tread of the foot, and is renewed after short periods as the truncated cone of the hoof, which has its base downward, constantly increases in circumference, so that the shoe becomes too small after it has been worn for a time.

The art of shoeing for specific purposes is of American origin and is a result of the development of the trotter. Shoes were first designed to influence speed or action. Now shoes are made also, to remedy defects due to faulty conformation or bad habits.

**Horsley, Sir Victor Alexander Haden** (1857-1916), Eng. surgeon, neurologist. The results of his researches in cerebral localization are of the greatest value. Among his numerous works are *Brain Surgery* (1887), *Hydrophobia and its Treatment* (1888), *Experiments upon the Functions of the Cerebral*

*Cortex* (1885), *Alcohol and the Human Body* (with Dr Mary Sturge)

**Horten**, seaport, Norway It is the naval arsenal of Norway, and has an observatory and nautical museum, p 10,000

**Hortensius**, Quintus (114-50 B C), was perhaps, after Cicero, the most famous orator of ancient Rome He was quaestor in 81, edile in 75, praetor in 72, and consul in 69 B C

**Horthy, Nicholas** (1868- ), Hungarian official was admiral-commander of the Austro-Hungarian fleet in the last months of World War I and Regent from 1920-44 As Regent, he preserved the stability of Hungary in the troublous years of Central European conflict when German and Italian aspirations brought pressure on Budapest

**Horticultural Societies** exist for the promotion of the knowledge and practice of gardening In the United States there are now over five hundred such societies

**Horticulture** See Gardening

**Horton, Samuel Dana** (1844-95), American writer on coinage, was born at Pomerooy, O He was secretary of the International Monetary Conference at Paris in 1878 and a delegate to the session of 1881 He published *The Monetary Situation* (1878), *Silver and Gold, Their Relation to the Problem of Resumption* (1880), *Silver in Europe* (1900)

**Hortus Siccus** See Herbarium

**Horus**, in ancient Egyptian mythology, was the sun god, identified with the Greek Apollo, and with Harpocrates, the last and weakly child of Osiris At Rome he was worshipped as a god of quiet life and silence See Mythology, Egyptian

**Hosack, David** (1769-1835), American physician Professor in Columbia, and later in the College of Physicians and Surgeons, New York, he was an authority on yellow fever, was the first to tie the femoral artery of the thigh in this country, and wrote on contagious disorders and on vision

**Hosanna** ('Oh, save'), the usual cry of marching processions in Jerusalem, used when Jesus made his triumphal entry into Jerusalem

**Hose**, a flexible pipe of rubber, leather, metal, cotton or similar fabric, used to convey fluids or gases Fire hose is carefully made of interwoven cotton yarn lined with a high grade of rubber, and must be able to withstand pressures ranging from 300 to 700 pounds Among other commercial purposes for which hose is employed, mention may be made of air brake and heating service on railways, pneumatic and steam drills and similar

appliances, and the conveyance of gas, oil and water

**Hosea**, the first in order of arrangement of the twelve Minor Prophets, and among the earliest of all the prophets to commit his discourses to writing He was a native of the northern kingdom, and prophesied in the reigns of Jeroboam II and his successors—between B C 747 and 722 His prophecies fall into two parts (1) in which he recounts the tragedy of his marriage, and uses it to illustrate the relations between Jehovah and His unfaithful people, (2) in which he sets forth more fully the infidelity of Israel, as shown in its idolatry, its internal corruptions, threatens it with the severest penalties, and yet promises deliverance and restoration, if it but repent There has been much controversy regarding the marriage of Hosea, whether it was a real experience or only a parable

**Hosiery** See Knitting

**Hosmer, Harriet Goodhue** (1830-1908), American sculptor After studying at Boston and at St Louis she went to Rome to study under John Gibson Her bronze statue of Thomas H Benton is in Lafayette Park, St Louis, and a fountain by her is located in Central Park, New York

**Hospice**, a monastic house of shelter for travelers, especially those passing over the Alps

**Hospital Corps**, U S The Hospital Corps is attached to the Medical Department, and in time of war performs all the necessary field hospital and ambulance service Each division of the army in the field is accompanied by a detachment of the Hospital Corps and each medical officer when on the march is attended by a mounted private of the corps

**Hospitallers**, charitable brotherhoods, founded for the care of the sick in hospitals The vow to devote one's self to this work of mercy is usually added to the vows of chastity, poverty and obedience One of the earliest recorded instances of such a brotherhood is the Order of the Knights of Malta, first established in Jerusalem

**Hospitals**, institutions for the medical or surgical care of the sick and injured

In addition to hospitals of a general character, admitting all classes of patients for treatment, a large number of special institutions, both charitable and private, exist These include hospitals for contagious diseases, children's and maternity hospitals, convalescent hospitals and hospitals for incurables, cancer and tuberculosis hospitals, and hospitals for the treatment of diseases of the eye, ear, nose

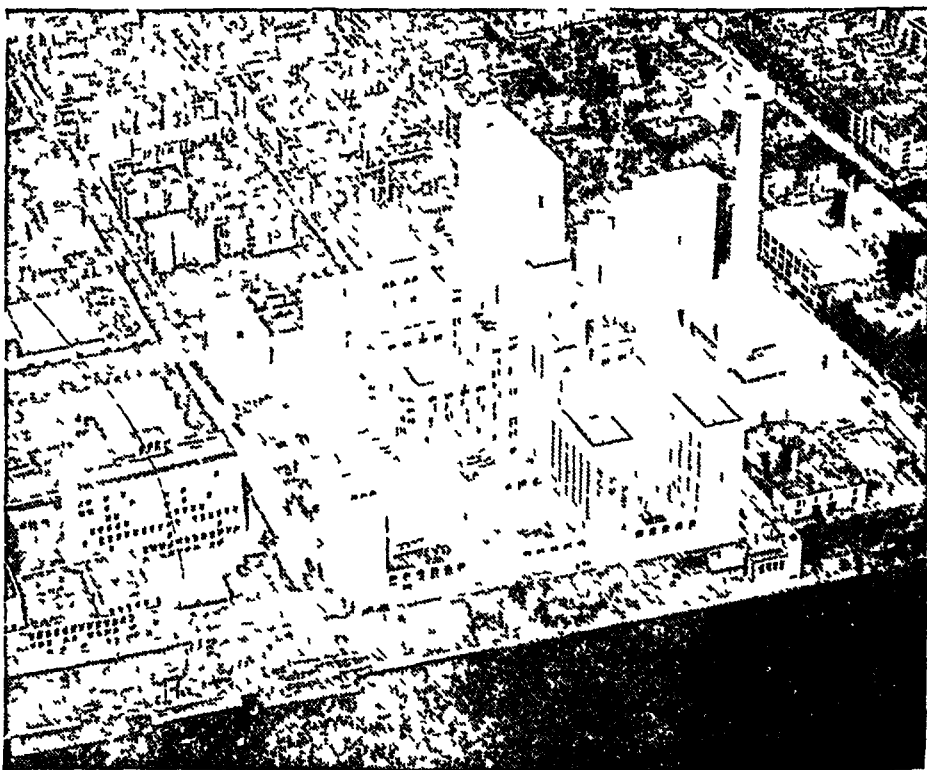
throat, and skin, and various other specialties

The rulers of India, Persia and Arabia maintained hospitals in very early times, and the healing art was practiced in the temples of ancient Egypt, Greece, and Rome. Medical schools were conducted in connection with the early Egyptian temples, and Egyptian physicians are said to have held clinics there centuries before the time of Christ. In Greece and later in Rome, the temples of Æsculapius were the chief houses of healing. The House of Sorrow for the care of the sick and wounded was founded in Ireland in 300 B.C., King Asoka of

existence, dates from about the year 660 A.D.

During the Middle Ages practically all of the monasteries had some provision for the care of both cloistered patients and strangers, one of the most famous of these being the Benedictine Abbey of Cluny, established in 910. Privately endowed hospitals first appeared in Italy, where a number of such institutions were in existence as early as the 12th century.

In the United States the earliest hospital was erected on Manhattan Island in 1663 to care for the soldiers and Negroes of the East



*A Modern Hospital*

India established hospitals throughout his dominions about 260 B.C., and the Roman senator Antonius erected buildings for the care of the dying and for lying-in women about 170 A.D.

With the general recognition and spread of Christianity, hospitals multiplied. In the 1st half of the 7th century hospitals were founded by St. John the Almsgiver at Alexandria, by Bishop Brassianus at Ephesus, and by St. John Chrysostom, St. Pulcheria, and St. Sampson in Constantinople. The 1st hospital in France belonged to the 6th century and the Hotel Dieu in Paris, the oldest hospital in

India Company. The oldest now in existence is the Pennsylvania Hospital, dating from 1750, and growing out of the medical work done at the Philadelphia almshouse that was begun 20 years before. In New York City, the New York Hospital dates from 1771, Bellevue from 1811, St. Vincent's from 1849, St. Luke's from 1850, and Mt. Sinai from 1852. The Massachusetts General Hospital dates from 1821, and the Johns Hopkins Hospital of Baltimore was chartered in 1867 and opened in 1889. There are about 6,200 hospitals in the United States.

*Administration*—In the United States, the

government of a hospital is usually vested in the board of managers or trustees, who exercise their executive authority through a superintendent. The immediate medical care of the patients is in the hands of the resident staff of recently graduated physicians or internes, who are directed and supplemented by the visiting and consulting staffs of experienced practitioners. The nursing is usually done by a corps of young women who are receiving training under the supervision of the visiting staff and graduate nurses.

Most city hospitals maintain ambulances, equipped with beds, instruments, and restora-

pressed institutions. In Ohio the law enables a board of commissioners to contract with non-profit non-sectarian hospitals to pay for the care of indigent persons from state relief funds.

The report of a nation-wide survey by the National Committee for Mental Hygiene states that out of about one hundred mental hospitals chosen from 35 states, 77 were overcrowded and 27 closed to further cases.

One reaction resulting from crowded conditions has been a demand for an eight-hour day by nurses. This by 1936 had become generally operative in 729 hospitals.



*Interior Scene in a Modern Hospital*

tives, for the transportation of the sick or wounded to the hospital, each ambulance being in charge of a surgeon, who applies first aid and cares for the patient before or during transportation. See **AMBULANCE**.

Since the depression the lack of funds has hampered activity of hospitals both in the United States and elsewhere.

In England the need for free service, which was threatening to bankrupt medical institutions, was met by a contributory plan whereby needy persons and unemployed workers, by making a small weekly or monthly subscription, could obtain hospitalization insurance.

In the U S and Canada, the Blue Cross Non profit plan for hospital care had by 1946 an enrollment of over 23,000,000.

The aid of the state and national governments is slowly being advanced to hard-

In 1935 the Canton Hospital in China celebrated its hundredth anniversary. A new building was opened there in November, 1936, and the National Government honored the institution with a gift of \$250,000 toward the construction of Sun Yat-sen Medical College.

The Beaujon Hospital in Paris is an innovation in medical buildings. Completed in 1937, it is claimed to be the most up-to-date and the largest institution of its kind in France.

Equally modern in concept is the hospital ship recently launched by the St John's Guild of New York City. This boat, guaranteed to be unsinkable, will carry fifteen hundred convalescent invalids on water borne cruises.

In conjunction with this article, the following articles should be consulted in addition to

those already suggested MEDICINE, SURGERY, NURSING, HYGIENE, SANITARY SCIENCE, ANTISEPTICS

**Bibliography**—Consult Burdett's *Hospitals and Asylums of the World* (4 vols), and *Hospitals Annual*, Hornsby and Schmidt's *The Modern Hospital* (1913), Chapman's *Hospital Organization and Operation* (1924), Weber's *First Steps in Organizing a Hospital* (1924), Bachmeyer and Hartman, *The Hospital in Modern Society* (1943)

**Hospital Ship**, a vessel specially designed to care for the sick and wounded of the army and navy. The United States was the 1st nation to supply its navy with special ships equipped and manned to take care of sick and wounded soldiers and sailors, such ships being originally used in the Spanish-American War. In World War I and II their use for the care and transportation of disabled soldiers formed an important part of the hospital and Red Cross service of nearly all the nations. See HOSPITALS, MILITARY

**Hospitals, Military** Military hospitals include all those institutions which are devoted to the care of the sick and wounded of the military forces, whether in peace or war.

The peace hospitals of the U. S. Army are of three classes—post hospitals, general hospitals, and department hospitals. Post Hospitals are established at all garrisoned posts, for the reception of patients from those garrisons to which the hospital belongs. General Hospitals are maintained to afford better facilities than can be provided at the ordinary post hospitals for the treatment of serious cases, to afford opportunities for the performance of the more difficult surgical operations, facilities for which may be lacking at the post hospitals, to study and finally dispose of cases that have long resisted treatment elsewhere, and to determine questions of the existence, cause, extent, and permanence of mental and physical disabilities of long standing or unusual obscurity, to instruct and train junior medical officers in general professional and administrative duties, and to form a nucleus for the development of the larger hospitals required in the home territory in time of war.

In addition to the ordinary general hospitals, the United States has two general hospitals devoted to the treatment of special diseases. These are the Army and Navy General Hospital at Hot Springs, Ark., for such diseases as the waters of the Hot Springs have an established reputation for benefiting, and the General Hospital at Fort Bayard, N. M., which has been set apart as a sanatorium for the treat-

ment of officers and men suffering from pulmonary tuberculosis.

Department Hospitals are similar in organization, administration, and function to general hospitals. In time of war the activities of the military establishment embrace the service of the interior and the service of the theatre of operations. The hospitals in the service of the interior are as follows: camp hospitals, immobile units organized and equipped for use in camps, additional general hospitals established by the Surgeon-General at his discretion, hospitals at ports of embarkation where there is not already a general hospital, and hospitals for prisoners of war, having the same status as general hospitals. Also included in the service of the interior are Hospital Trains and Hospital Ships. Hospital trains may be of special construction or may be improvised from ordinary passenger or freight trains.

The theatre of military operations is divided into the zone of the advance and the zone of the line of communications, or the evacuation zone, which forms a connecting link with the service of the interior. Soldiers wounded on the battle line, after receiving first aid from the sanitary personnel attached to the battalion, are directed or carried to the regimental aid stations, which are established as the engagement develops and the number of wounded warrants. From here they are taken by the bearer section of the ambulance company to the dressing stations, whence they may be sent back to the front, despatched to the station for the slightly wounded, or carried by ambulance to the field hospital.

The Field Hospital, the only hospital in the zone of advance, is a mobile unit, with equipment limited to those things absolutely necessary to provide shelter, nourishment, and emergency treatment until the patient can be transferred to the immobile units in the rear. From the field hospital the wounded are transferred as soon as possible, usually by motor ambulance, to the Evacuation Hospital in the line of communication. Their function is to replace or take over the patients of the field hospitals, so that the latter may move with their divisions. When many wounded are received, treatment may be of the emergency type only, but where conditions are favorable complete treatment is carried out. Serious cases requiring protracted care and all patients incapacitated permanently or for a long period are sent from the evacuation to the base hospital.

The Base Hospital is designed for the definitive treatment of cases received from the other hospitals and for those originating on the line

of communication Patients requiring special treatment or those unfit for further service are transferred to the home territory by hospital trains or ships Convalescent camps may be established as branches of base hospitals, and contagious disease hospitals may be organized when necessary

The military hospital services of other countries correspond approximately to that of the United States The great world conflict of 1914-18 caused the increase and development of these services beyond anything previously conceived, and revolutionized methods of treatment and the care and transportation of the wounded

In the United States, naval hospitals were established on shore in connection with navy yards and naval stations, and the Navy Department further designated certain vessels to be employed as hospital ships See HOSPITAL SHIP

Marine hospitals for sick and disabled seamen of the merchant marine are maintained by the U S Public Health Service See PUBLIC HEALTH SERVICE

See MEDICAL DEPARTMENT, U S ARMY, MEDICAL DEPARTMENT, U S NAVY, SURGERY

**Hospital Trains** See Hospitals, Military

**Hospodar**, or **Gospodar**, a Slavonic word meaning 'master,' 'lord,' is a title which was given to Moldavian and Walachian rulers while those states were still subject to Turkey

**Host**, the consecrated bread of the eucharist In the Roman Catholic Church the host is a thin circular wafer of pressed unleavened flour on which is stamped some emblematic device, as the Crucifixion, or the Lamb The celebrant, who uses at mass a larger host than that reserved for other communicants, first breaks it into two pieces, one of which he himself receives The other piece he breaks over the chalice, and drops a portion into the wine—'the mingling of the body and blood of Jesus Christ' In the Oriental churches the eucharist is celebrated in leavened bread, one of the grounds of separation from the West alleged by Michael Cerularius being the Western practice of using unleavened bread In the Greek Church the consecrated bread is dipped in the wine before it is administered to the communicants The use of wafer bread in the Episcopal Church is not uncommon, but it is usually quite plain See EUCHARIST, CORPUS CHRISTI

**Hostage**, a person given to an enemy as a pledge for the proper fulfilment of treaty

conditions Formerly the evasion of the terms of the treaty was regarded as entitling the enemy to put to death the hostages

**Hostilius, Tullus** (d 640 B C), third of the legendary kings of Rome, is said to have succeeded Numa in 670 B C, and to have conducted a series of successful wars

**Hot Air Engine** See Air Engine

**Hot Air Heating** See Heating

**Hotbed**, an enclosed mass of fermenting material, usually covered with a glazed frame used in gardening for the rearing of fragile annuals, for propagating greenhouse plants by cuttings, seeds, or grafting and for forcing flowers

**Hotchkiss, Benjamin Berkeley** (1826-85), American inventor, was born in Watertown, Conn He became interested in gun making, and devised, in 1882, the machine gun which bears his name See GUNS

**Hotchpot**, in law, the entire mass of a decedent's estate available for distribution among his children The doctrine of hotchpot is a corollary of the principle of advancement, gifts made by a decedent before death to his children being regarded as constituting a part of the assets for equal distribution among all of those entitled to share therein

**Hotel**, a word with a varied and interesting history In France it originally meant the mansion house of a noble or a person of distinction, then, later, a place where paying guests were lodged and entertained At the present time in France and Belgium a *hôtel de ville* resembles in some respects the American city or town hall, usually containing a barracks, a prison, the offices of the various local bodies, the residence of the local chief magistrate, and the court house In the United States the forerunners of the modern hotel were the inns and taverns of colonial days The Natural Hotel, opened in Washington in 1827, was long noted as the home of eminent public men Delmonico's in New York was started in 1830, the United States Hotel, New York, in 1833, the Galt House Louisville, and United States Hotel, Boston, in 1835, and the Astor House, New York In 1841 the famous Planter's House of St Louis was opened, the largest hostelry w of the Alleghenies From that year the number and pretentiousness of American hotels increased with the rapid growth of the country, and it would take many pages merely to enumerate the important hotels of the present day in the United States See INN

**Hôtel de Ville**, the name given to the building used for carrying on public business

in cities and towns of France and Belgium. The most famous hôtel de ville is that of Paris. The structure was destroyed by the Communists in 1871, but was rebuilt in 1873-83 from the designs of Ballu and Deperthes, and is a fine specimen of Renaissance. See PARIS.

**Hothouse**, a term generally applied to glass houses used for raising tropical fruits and vegetables in temperate regions, or for forcing fruit, vegetables, or flowers. Hothouse cultivation is much more accurate and sure than ordinary outdoor gardening, as the grower is less dependent on weather and other uncontrollable influences. Tomatoes, grapes, cucumbers, peaches, beans, roses, carnations, ferns, asparagus, strawberries, and numerous bulbous and other flowering plants are among the plants commonly forced. See GARDENING.

**Hot Springs**. See Springs.

**Hot Springs**, city, Arkansas, county seat of Garland co. Here is located Hot Springs Reservation, which has made the city a noted health resort. The first settlers were French trappers and hunters who penetrated to the region about 1800, p. 21,370. *Hot Springs Reservation* (1832), the oldest National Park in the United States, was set apart by Congress in order to retain in the public possession the curative properties of the thermal waters located here. The Reservation adjoins the borders of the city at the foot of Hot Springs Mountain, and is a tract of 912 acres enclosing all the 46 hot springs.

**Houdini, Harry** (Eric Weiss) (1873-1926), American Magician, made world tours performing feats of escaping from handcuffs, strait jackets, submerged locked chests. He exposed fake spiritualistic performances, was first successful flier in Australia, he wrote *Spooks and Spiritualism, Rope Ties and Escapes, A Magician Among the Spirits, Handcuff Secrets*.

**Hottentot**, the native race of South Africa. The people call themselves Khoi-Khoi (otherwise Quai-Quai), and they comprise the Namaquas, the Koranas, and the Griquas, as well as the 'Totties,' who have been for generations the servants of the Boers. At the present time the so-called Hottentots proper number about 17,000, and the half breeds, mostly employed in the Cape Colony, probably 100,000. See BUSHMEN. Consult G. W. Stow's *Native Races of South Africa*.

**Houdon, Jean Antoine** (1741-1828), French sculptor, was born in Versailles. In 1861 he won the Prix de Rome. In 1785 he

came to the United States, where he sculptured the statue of Washington placed in the State house at Richmond, Va. Turgot, Rousseau, Voltaire, Diderot, Franklin, Lafayette, Mirabeau, Napoleon, and Mlle. Arnold are some of the other great personages whose features he has perpetuated.

**Hough, Emerson** (1857-1923), American novelist, was born in Newton, Iowa, educated at University of Iowa. His novels include *The Girl at the Half-Way House* (1900), *The Mississippi Bubble* (1902), *54-40 or Fight!* (1909), *The Passing of the Frontier* (1918), *The Covered Wagon* (1922), made into a film, *Mother of Gold* (1924).

**Hough, George Washington** (1836-1909), American astronomer, was born in Montgomery co., N. Y. He is best known for his studies of the planet Jupiter, and for his discovery of between 500 and 600 double stars.

**Hough, Walter** (1859-1935), American ethnologist, was born in Morgantown, W. Va. After 1886 he was connected with the U. S. National Museum as assistant, assistant curator, and curator (after 1910).

**Houghton**, village, Michigan, county seat of Houghton co., on Portage Lake, an arm of Lake Superior. The State College of Mines is situated here. It is the shipping point of a rich copper mining region, and has smelting works, machine and railroad shops, lumber mills, and drydocks, p. 3,693.

**Houghton, Alanson Bigelow** (1861-1941), diplomat, was born in Cambridge, Mass., served as ambassador to Germany, 1922-25, as ambassador to Great Britain, 1925-29, was Chairman of the Commission on International Justice and Goodwill.

**Houghton, George Henry** (1820-97), American Protestant Episcopal clergyman, was born in Deerfield, Mass. In 1848 he established in New York City, the Church of the Transfiguration, of which he remained rector for fifty years. When a committee of actors, who were arranging for the funeral of a member of their profession, asked a certain New York City clergyman to conduct the services, he refused because of his objection to the stage, and sent the committee to Dr. Houghton, whom he designated as the pastor of 'the little church around the corner.'

**Houghton, Henry Oscar** (1823-95), American publisher, was born in Sutton, Vt. He became a newspaper compositor and reporter, in 1849 set up his own printing establishment at Cambridge, and in 1852 founded

the well known Riverside Press In 1864 he organized the New York publishing house of Hurd & Houghton, in 1878 this firm took over the business of James R Osgood & Co, successors to Ticknor & Fields, and after 1880 continued at Boston under the name of Houghton, Mifflin & Co

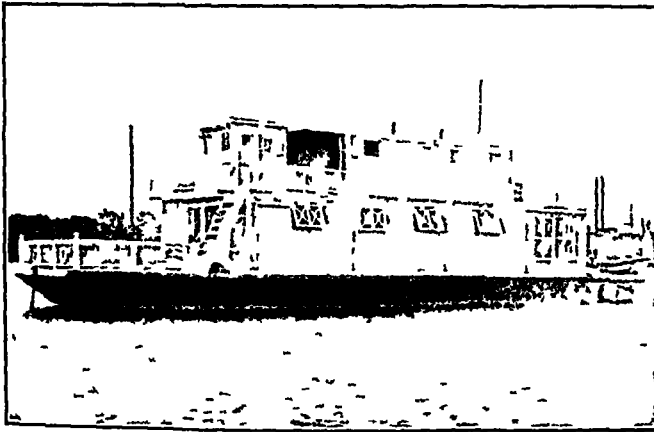
Houlton, town, Maine, county seat of Aroostook co, 125 m ne of Bangor The Ricker Classical Institute is located here It has lumber, woolen, and grist mills, foundries and machine shops, and an abbatoir, p 777

Hound, a name applied to dogs used in hunting The true hound, such as the Bloodhound and Foxhound, hunt only by scent In

**Hour Circle**, any great circle drawn from one celestial pole to the other The celestial meridian is that hour circle which passes through the zenith of the observer

**Hour Glass**, an appliance used to estimate definite portions of time, consists of a glass vessel with a narrow duct or neck, joining two oval-shaped receptacles in such a manner as to form the figure 8 Into this instrument, during its construction, sand or some other powder is introduced in such quantity as to occupy a definite period of time in flowing through the neck from the upper to the lower chamber

**Hours**, one of the 72 beautiful damsels whose companionship in paradise is part of



*A Modern Houseboat*

this division may also be included the Basset Hound, Beagle and Harrier The Greyhound and Deerhound run by sight alone See BLOODHOUND, FOXHOUND, BASSET HOUND, BEAGLE, GREYHOUND, DEERHOUND

**Hound's tongue**, a genus of plants belonging to the order Boraginaceae The funnel-shaped corolla has a short tube, and its throat is closed by blunt scales

**Hour**, a space of time consisting of 60 minutes, the twenty-fourth part of a civil day Solar and sidereal hours are the twenty-fourth part of the corresponding days See DAY, TIME

**Hour Angle**, the angle made with the meridian by the hour circle of a star, or the difference between the sidereal time of observation and the right ascension of the object observed It is measured in hours, minutes, and seconds of time, equivalent to the same number of degrees, minutes, and seconds of arc multiplied by 15

the reward of every true Mohammedan after death

**Hours**, Canonical See Canonical Hours

**House**, in law, generally signifies a building or part thereof used for human habitation The right of an occupier to protect his house against invasion or trespass is an ancient constitutional safeguard Except in the case of a criminal offence, an Englishman or American may hold his house against all comers It is not lawful to break into a house in execution of a civil warrant, except under exceptional writs issued by the court Any amount of force, however, can be used in putting into execution a criminal warrant For house construction see BUILDING

**House**, Edward Mandell (1858-1938), American statesman, was born in Houston, Texas, was among the most prominent of those who worked for the nomination of Woodrow Wilson for the presidency in 1912



During President Wilson's term of office he was one of his chief advisers, though he held no cabinet post. He was Chairman of the American Commission to the Supreme War Council of the Allies in London in 1917. He was a member of the American Commission to negotiate peace at Paris. Following the war he retired from public life, was joint editor with Professor Charles Seymour of *What Really Happened at Paris* (1921).

**Houseboat** Millions of the population of China, of Burma, and of India are born, live, and die in floating habitations closely resembling the thatched huts on land. In England the square-cornered, slow-moving craft of today first made its appearance in the river Thames, and has become one of the most important institutions of fashionable English life. The custom has spread to the United States, where numerous houseboats are to be found especially on inland and Southern waters.

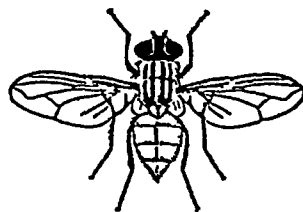
**Housebote**, the right of a tenant to cut timber on leased land for necessary repairs to any building thereon.

**Housebreaking** signifies breaking into a house, either forcibly or by fraudulent devices—by corrupting a servant—at any time of day or night, for the purpose of committing a felony.

**House Finch**, a small light-colored finch of Northern Mexico, the Southwestern United States, and the Pacific Coast, especially attractive on account of its musical, cheery, varied warble and beautiful plumage.

**House Fly**, the most familiar and most widely distributed of the dipterous insects, typical of the family Muscidae, to which belong also the Stable Fly, the Bluebottle, and numerous other varieties. The house fly breeds in fermenting organic matter, especially stable refuse and human excreta, depositing its eggs, in clumps, from four to eight days after mating. The eggs are ovoid in shape, white, and glistening, and approximately one millimetre in length. About 120 are deposited at once, and a single individual may lay several times. In from eight to twenty-four hours after deposition a tiny split appears at one end of the egg, and as this enlarges there emerges a slender white larva about 2 millimetres in length, without legs or distinct head, and provided with small hooklets at the mouth. It develops rapidly, twice casting its skin, and reaches maturity on the fourth or fifth day, when it undergoes transformation into the pupal stage, the

outer skin hardening to form a somewhat barrel-shaped pupal case, dark brown in color, and about 6 millimetres long. The adult fly emerges after five to seven days in midsum-



House Fly

mer, or a longer period in fall and spring, in a few days the female is ready to deposit eggs, and the life cycle is repeated. As ten to twelve generations may be produced in a single summer, it is easily seen that the possibilities for multiplication are enormous.

Flies are active agents in the dissemination of disease, especially conditions affecting the intestinal tract, as typhoid fever and infantile diarrhea. As the fly crawls over infected materials the hairs and bristles that cover its body become laden with disease germs, which are subsequently deposited upon human foodstuffs and result in their contamination. The rôle of the house fly as a transmitter of infection has become definitely known only within the last two decades, but with the general recognition of the dangerous character of the insect, a vigorous campaign for its destruction has been carried on. Among the most important measures are the elimination of breeding places by proper methods of refuse disposal, the chemical treatment of manure—especially with borax—to destroy eggs and larvae, the destruction of the larvae in specially constructed traps. Consult L. O. Howard's *The House Fly, Disease Carrier* (1911), Howard and Hutchinson's *House Flies* (*Farmers' Bulletin No. 679*, 1915).

**Houseleek**, a genus of plants, a subdivision of the order Crassulaceae. They are succulent plants, the leaves being commonly revolute. Their flowers are usually stellate, sepals and petals numbering six or more.

**Housemaid's Knee**, a popular name for a swelling of the bursa, or pouch containing serous fluid, which lies just over the kneecap. It is the result of continued irritation, such as may follow constant kneeling on hard floors. The onset is sudden, the knee becoming red, hot, swollen, and tender.

**House of Commons** See Parliament

**House of Lords** See Parliament

**House of Representatives** See **United States, Government**

**House Sparrow**, or **English Sparrow**, a small arboreal finch found throughout the greater part of Europe, whence it has been introduced into Australasia and America. It is about 6 inches in length, stout and stocky in form, with a short, stout bill, pointed wings, and a short tail. The male is brown above, with stripes of black and chestnut, and grayish white beneath. The wings show a patch of bright chestnut and white bands, the top of the head is grayish, and the throat and chest patch black. The female is grayish brown or olive above, and brownish white or gray beneath. The voice is harsh, the usual note being an unmusical chirp. The house sparrow is especially abundant in towns and cities. It builds a rough nest of straw or grass about houses or in trees, and lays from four to seven bluish white eggs, speckled or blotched with brown and black. Several broods are reared in a season.

**Housing** Under the title **Housing** may be included all the social activities that tend to supply, or make better, abodes of human beings, provided that such activities are not limited to the construction or improvement of an individual's own domicile by and for himself alone. In its broadest sense it embraces the efforts of co-operative associations as well as those of individuals for other individuals, or of corporations, municipalities, States, or national governments. The housing problem at present most prominent in the public mind concerns chiefly overcrowded conditions in the great cities. The housing problems in the United States are epitomized in New York because its size and social character, as an immigration port, tend to magnify the unwholesome conditions resultant from poor housing conditions.

Agitations for public control of housing in New York began in 1842. No action was taken until 1863 when a council of hygiene and public health was organized. Although the department of health was formed in 1866 and the first tenement house law was passed in 1867, restrictions were loose and builders were comparatively free to do as they wished, until the passage of the 1901 tenement house law accompanied with the creation of the tenement house department. This law, improved by successive amendments and enforced by the department, marked the beginning of housing reform in New York. In addition, New York's lead furnished the impetus to other cities so that within a few years

many cities and states passed housing regulations of some kind. The 1901 law, however, was superseded by another after 25 years of use, and the present law in New York State is much more comprehensive than the earlier legislation.

The crisis in housing conditions prior to, during and following World War I awakened the public to a renewed interest in housing reform. Not only was there a shortage of building materials and therefore, a restriction upon the erection of buildings, but this was accompanied by serious housing congestion, increased by the return of the soldiers after the Armistice. In 1917 the acute scarcity of housing accommodations, especially in munitions and shipbuilding centers made Federal action imperative. The United States Shipping Board was given an appropriation to provide housing for its workers. The United States Housing Corporation carried on construction for the Bureau of Industrial Housing and Transportation in 128 communities. Housing conditions became worse after the war. In New York, 1921, with 982,000 tenements, only 1,510 were vacant. Then came a period of intensive building, through the 1920 Tax Exemption Act, which was partly maintained to satisfy the city's housing needs.

By the middle of 1939 the federal government had spent \$800,000,000 in financing housing for about 160,000 slum families.

Throughout the first three decades of this century there were varied attempts at housing reform—private agencies conducted research and formulated plans, state legislatures sought to improve and increase regulations, boards of administration and control were appointed (notably, the New York State Board of Housing in 1926), but the years of 1933 and 1934 marked the biggest strides forward in housing reform. In June, 1934, a federal bill was passed which provided for the stimulation of renovating and modernizing campaigns, for protection against foreclosure through long-term refinancing of mortgages, for relief to investors through building and loan associations, and for the encouragement of home construction on a large scale. This was followed by the creation of the Federal Housing Administration (FHA) to administer its provisions. In 1941 the Division of Defense Housing Coordination was created and April 8, 1942 the War Production Board halted non-essential construction of buildings. There was a serious housing shortage after World War II.

**Housman, Alfred Edward** (1859-1936), English poet and Latinist, and brother of Laurence Housman. His best known work, *A Shropshire Lad* (1896) gave him a place even among the great figures of the late Victorian era. *Last Poems* (1922) and *The Name and Nature of Poetry* (1933) reminded the world of the Cambridge scholar who was devoting his life to the major Latin poets.

**Housman, Laurence** (1865- ), English author and artist, made his first reputation as a book illustrator. His pictorial work includes drawings for Meredith's *Jump to Glory Jane* (1892), Jonas Lie's *Weird Tales* (1892),

*Royal Runaway* (1914), *The Return of Alcibiades* (1916), *Bad in Hand* (1916), *The Lord of the Harvest*, *The Sheepfold* (1918), *Backwords and Forewords* (1945).

**Houssaye, Henry** (1848-1911), French historian, was born in Paris. His *Histoire d'Alcibiades* (1873) was awarded the Thiers Prize by the French Academy. His 1814 and 1815, which appeared in three volumes between 1888 and 1899, is a work of the highest authority on the last campaigns of Napoleon.

**Houston**, city, Texas, county seat of Harris co., is situated on an arm of Galveston Bay formerly known as Buffalo Bayou, but



*British Scheme, Woolwich*

Christiana Rossetti's *Goblin Market* (1893), and Shelley's *Sensitive Plant* (1898). Subsequently he became a writer of verse, and produced *Green Arras* (1896), *Rue* (1899), *Spikenard* (1899), *Mendicant Rhymes* (1906), and *The Heart of Peace* (1919), as well as allegories in prose, such as *The Blue Moon* (1904) and *The Cloak of Friendship* (1906). His *Bethlehem*, a nativity play, was presented at London University in 1902, *Prunella* (in collaboration with Granville Barker) at the Court Theatre in 1904, and in New York in 1913. Other works include *An Englishwoman's Love Letters* (1900), published anonymously, *A Modern Antinous* (1901), *Sabrina Warham* (1904), *The Chinese Lantern* (1908), *Lysistrata: A Modern Paraphrase* (1910), *Pains and Penalties* (1911), *The New Child's Guide to Knowledge* (1911), *John of Jingalo* (1912). The

since its improvement as the Houston Ship Channel, and on eighteen railroads. The Ship Channel, completed in 1914 to a depth of 25 ft at a total cost of \$4,500,000, connects the city with deep water in Galveston Bay, and makes possible direct communication with New York City, Tampa, Fla., Tampico, Mexico, and other points, while the Intercoastal Canal, now under construction, will establish a landlocked direct water route to coastwise points in Texas and Louisiana and to productive districts inland, via the Mississippi River.

The public school system includes 34 schools for white children and 17 for negroes. Chief among the educational institutions is the Rice Institute. Important industries are petroleum refining, cotton compressing, cotton-seed and peanut oil plants, rice and flour mills, foundries and machine shops, rolling

mills, planing mills, and brick and tile works. There are large packing houses and extensive railroad shops. The city is an important cotton and lumber trade center and is a large exporter of sugar and cotton-seed oil, rice, rice products, and petroleum. Deposits of iron ore, coal, lignite, and clay are found in the vicinity.

Houston was settled in 1836, and named in honor of Sam Houston, and the next year was the capital of the Republic of Texas, p 386,150

**Houston, David Franklin** (1866-1940), American educator and Cabinet officer, was born in Monroe, N C. He served as Secretary of Agriculture from 1913 to 1920, was a member of the Federal Reserve Bank Organization Committee (1913-14), member of the Council of National Defence (1916-20), Secretary of the Treasury, chairman of the Federal Reserve Board and of the Farm Loan Board (1920-21).

**Houston, Sam** (1793-1863), American soldier and political leader, was born near Lexington, Va. After the death of his father in 1806 he removed with his mother to Tennessee, where he passed several years as the adopted son of a Cherokee Indian chief. Following a brief study of law, he practised successfully in Tennessee, was a member of Congress (1823-7), and governor of the State (1827-9). In 1832 Houston removed to Texas, where he became one of the leaders in the movement for the overthrow of Mexican rule. As commander-in-chief of the revolutionary forces of Texas, he defeated and captured the Mexican leader, Santa Anna, at the Battle of San Jacinto, thereby securing Texan independence. He was twice president of Texas (1836-8 and 1841-4), and was instrumental in bringing about its annexation to the United States. He served as U S Senator from 1846 to 1859, and governor of Texas from 1859 to 1861, from which office he was deposed because he did not favor the Confederate cause. Consult *Bruce's Life of General Houston*, *Bradley's Winning the Southwest* (1912).

**Hovey, Richard** (1864-1900), American poet, was born in Normal, Ill. Among his works are *The Laurel*, an *Ode* (1889), *Songs from Vagabonds* (with Bliss Carman, 1893-6), *Along the Trail* (1898), *Taliesin*, a *Masque* 1899).

**Howard, Bronson** (1842-1908), American dramatist, was born in Detroit. After several years spent in newspaper work, he turned to playwriting, in which field he early achieved

success, for many years enjoying an enviable reputation as a dramatist. After 1875 he divided his time between New York and London. Among his plays are *Saratoga* (1870), *The Banker's Daughter* (1878), *Shenandoah*, *Peter Stuyvesant* (1899), *Kate* (1906).

**Howard, Catherine** (1521-42), 5th queen of Henry VIII, was a granddaughter of the second Duke of Norfolk. Between July 21 and Aug 8, 1540, she was privately married to the king. Shortly afterward evidence of her immoral conduct before her marriage was brought to light, and she was beheaded.

**Howard, Esme** (Baron Howard of Penrith) (1863-1939), British diplomat, was born in Greystoke Castle, served as minister to Switzerland from 1911 to 1913, and to Sweden from 1913 to 1919, when he was transferred to Spain. In 1924-30 he was ambassador to the United States.



Julia Ward Howe

**Howard, Henry Clay** (1860-1930), American diplomat, was born in Mount Sterling, Ky, and in 1909-10 chairman of the Republican State campaign committee. In 1911-13 he was United States minister to Peru.

**Howard, Jacob Merritt** (1805-71), American legislator, was one of the founders of the Republican Party in Michigan, attorney-general of the State (1855-60), U S Senator (1862-71), and a delegate to the Loyalist Convention held at Philadelphia in 1866. He translated from the French *The Secret Journal of the Empress Josephine*.

**Howard, John** (1726-90), English philanthropist. Chiefly as the result of his efforts, two acts were passed in 1774, one making provision for fixed salaries to be paid to the jailers, and the other enforcing greater cleanliness in prisons, with a view to the prevention of the dreaded jail fever. He also

travelled extensively. Consult his *Correspondence*, and *Lives* by Taylor, Dixon, and Field.

**Howard, Leslie** (1893-1943), English actor. After his discharge from the army in 1919 he became an actor. In 1920 he came to N Y. He appeared in his own play *Murray Hill* (1927). In 1930 he appeared in motion pictures and his restrained type of acting won for him many successes including *Outward Bound*, *Of Human Bondage*, *The Petrified Forest*, *Berkeley Square*, *The Scarlet Pimpernel*, Shaw's *Pygmalion*, of which he was director, and *Intermezzo*. June 1, 1943 the plane in which he was approaching London was destroyed by the Nazis.

**Howard, Oliver Otis** (1830-1909), American military man, as commander of the Army of the Tennessee, accompanied W T Sherman in his March to the Sea and through the Carolinas. He became a major-general in 1886, commanded the division of the Pacific and the Atlantic, and retired in 1895. General Howard was the first president of Howard University, which was named for him.

**Howard, Sidney Coe** (1891-1939), American playwright, author of *They Knew What They Wanted*, winner of the Pulitzer Prize in 1924, *Ned McCobb's Daughter* (1926), *The Late Christopher Bean* (1932), and more recently scenarios for motion pictures.

**Howard University**, a coeducational institution of higher learning in Washington, D C, founded in 1867 by Gen O O Howard.

**Howe, Elias** (1819-67), American inventor, succeeded in devising the lock-stitch sewing machine, patented in the United States in 1846. For a long time he vainly tried to secure recognition for his invention, long and tedious litigation followed, chiefly with Isaac M Singer. The courts finally decided in Howe's favor.

**Howe, Frederic Clemson** (1867-1940), American lawyer and public official, was born in Meadville, Pa. In 1905 he was special U S commissioner to investigate municipal ownership in Great Britain and from 1906 to 1909 he was a member of the Ohio Senate. He became commissioner of immigration at the Port of New York in 1914. In President F D Roosevelt's New Deal, Howe became consumers' counsel in the AAA and was one of those affected by the controversy over the ousting of Jerome N Franks, AAA's chief counsel. Howe was an authority on marketing cost, having been an early associate of Tom Johnston, Newton D Baker and Brand Whitlock in the Liberal movement

in Cleveland. In 1934, he urged that milk be made a public utility and regulated as such. His works include *The Confessions of a Monopolist* (1907), *Socialized Germany* (1915), *Why War?* (1916), *The High Cost of Living* (1917), *The Land and the Soldier* (1919).

**Howe, Joseph** (1804-73), Canadian editor and statesman, was born near Halifax, N S, and in 1828 purchased *The Nova Scotian*, which he owned and edited for many years. In 1835 he published an article which led to his indictment for libel of the municipality of Halifax. He conducted his own defense so ably that he was acquitted. For 11 years he devoted himself to the obtaining of responsible government for Nova Scotia, and to its establishment in 1847, he contributed more than any other one man. When, however, Confederation became an accomplished fact (1867), upon the promise of better financial terms to Nova Scotia, Howe accepted the position of president of the council in the Cabinet of Sir John MacDonald. In April, 1873, he was appointed lieutenant-governor of Nova Scotia, but died a month later.

**Howe, Julia Ward** (1819-1910), American writer and philanthropist, was born in New York. In 1843 she married Dr Samuel Gridley Howe and was associated with him in editing the Boston *Commonwealth*, an anti-slave journal. Her home in Boston was one of the meeting-places for the New England group of American men of letters and science. She wrote many essays, biographies, poems. Her finest poem, 'Battle-Hymn of the Republic,' was written while visiting the camps near Washington during the Civil War, and was first published in the *Atlantic Monthly* (1861). Consult her *Reminiscences* (1899) and Richard's *Two Noble Lives* (1911).

**Howe, Mark Antony de Wolfe** (1864), American man of letters. He was associate editor of the *Youth's Companion* (1888-93), assistant editor of the *Atlantic Monthly* (1893-5), again associate editor of the *Youth's Companion* (1899-1913), and editor of the *Harvard Graduates' Magazine* (1917). He is the author of many works, chiefly biographical, among which *Barrett Wendell and His Letters* won the Pulitzer Prize for Biography, 1924.

**Howe, Richard, Earl** (1726-99), English admiral. Soon after the outbreak of the American War for independence, he was made a vice-admiral, and in February, 1776, was appointed commander in chief of the British naval forces in America, to co-operate with his brother. Consult Barron's *Life*.

**Howe, Samuel Gridley** (1801-76), American philanthropist, was born in Boston, Mass. After studying the methods employed in Europe for educating the blind, he helped to found (1833), and directed until his death, the Perkins Institution for the Blind in Boston, pioneer institution of its kind in America. His most famous pupil was Laura Bridgman. He was one of the founders (1851), and for one year editor of an anti-slavery paper, the *Boston Daily Commonwealth*, and was an active promoter of the free-State movement in Kansas.

**Howe, Timothy Otis** (1816-83), American lawyer and legislator. He was a judge of the circuit and supreme courts of Wisconsin (1850-55), and member (Republican) of the U S Senate (1861-79). He was Postmaster-General of the United States in the Cabinet of President Arthur (1882-3).

**Howe, Sir William, Fifth Viscount** (1729-1814), English general, prominent in the American War for Independence, was in immediate command of the British in the attack upon Bunker Hill (June 17, 1775). In October, 1775, he succeeded General Gage in command of all the British land forces in America, outside of Canada. He defeated Washington at White Plains (Oct. 28, 1776), captured Fort Mifflin (Nov. 16, 1776), and after wasting valuable time in New York, moved by water against Philadelphia, late in the summer of 1777. He occupied Philadelphia (Sept. 26, 1777) after the battle of the Clouds, defeated Washington at Germantown (Oct. 4, 1777), and then spent the winter inertly in Philadelphia. His military conduct having been severely criticised in England, he was relieved at his own request, and in May, 1778, relinquished his command to Sir Henry Clinton. Consult his *Narrative Before a Committee of the House of Commons* (1780).

**Howell, John Adams** (1840-1918), American naval officer and inventor, was born in Bath, New York. He was graduated from the United States Naval Academy in 1858, and served on various ships in the Civil War. He invented the gyroscopic steering torpedo, a disappearing gun carriage, etc., and wrote several books on technical subjects.

**Howells, William Dean** (1837-1920), American novelist, poet, and editor, was born in Martin's Ferry, Ohio. From 1840 to 1849 the family resided at Hamilton, Ohio, described in Howells' charming account of his youthful days, *A Boy's Town*. There and in other towns of Ohio the father published coun-

try papers, on which his son worked as carrier, compositor, and contributor. After serving as correspondent and editor for Columbus and Cincinnati papers, Howells was made U S consul at Venice (1861-5). Meanwhile (1859-61), he had won recognition by his contributions to the *Atlantic Monthly*, and had visited the East, and formed friendships with the Boston and New York literary groups. On his return to America he was connected (1866-81), with the *Tribune*, *Times*, and *Nation* of New York, and from 1871 to 1881 edited the *Atlantic Monthly*. After travelling for two years in Europe he conducted the 'Editor's Study' in *Harpers' Magazine* for five years and resigned to become editor of *The Cosmopolitan*. This engagement was soon terminated and he took up the conduct of 'The Editor's Easy Chair' in *Harper's*, which he continued until his death in 1920. He was the president, and one of the original members, of the American Academy of Arts and Letters.

Howells stands in the foremost rank of American authors not only as a novelist, but also as a writer of poems, books of travel, and biographical and literary essays. His published works include *Poems* (1873-86, and 1895), the novels, *Their Wedding Journey* (1871), *The Lady of the Aroostook* (1878), *The Rise of Silas Lapham* (1885), *Indian Summer* (1886), *The Coast of Bohemia* (1893), *A Fantasy* (1914), the general works, *Venetian Life* (1866), *Italian Journeys* (1867), *Through the Eye of the Needle* (1907), *Roman Holidays* (1908), *Familiar Spanish Travels* (1913), *The Seen and the Unseen at Stratford-on-Avon* (1914), *Years of My Youth* (1915), a number of farces, *The Sleeping Car*, *The Mouse Trap*, *The Elevator*, etc., sketches and reminiscences, *A Boy's Town* (1890), *Impressions and Experiences* (1896), *My Mark Twain* (1911), and numerous short stories. His *Collected Works* (1912 et seq.) have been edited by Prof. Brander Matthews.

**Howison, George Holmes** (1834-1917), American mathematician and philosopher, was Mills professor of philosophy at the University of California (1884-1909), and in 1909 emeritus professor of philosophy. He edited the University's philosophical publications, and was co-editor of the *Psychological Review* and of *The American Theological Review*. His works include *Conception of God* (jointly with Profs. Royce, Le Comte, and Mezes, 1897), *The Limits of Evolution* (1901, 2d ed. 1904), *Philosophy, Its Funda-*

*mental Conceptions and Its Methods* (1906)

**Howitt, Mary** (1799-1888), English writer, was born in Coleford, Gloucestershire. In addition to the work she did in collaboration with her husband, William Howitt, she wrote dainty children's lyrics and other poems, and first made known, by her Translation, the work of Hans Andersen



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*William Dean Howells*

**Howitzer**, is a type of cannon intermediate between the gun and the mortar. See ARTILLERY, COAST DEFENCE, GUNS, MORTAR

**Howler, Howling Monkey, or Stentor** (*Myiotes*), a genus of Central and South American monkeys (most abundant in Brazil), remarkable for the dilatation of the hyoid bone into a hollow drum, which communicates with the larynx, makes a conspicuous external swelling of the throat, and gives prodigious power to the voice

**Howth**, peninsula, Ireland, on the n side of Dublin Bay, rises seaward to a rocky height (Hill of Howth, 563 ft). The abbey is a picturesque ruin, p 1,200

**Hoxie, Vinnie Ream** (1847-1914), American sculptor. She received from Congress commissions to execute statues of President Lincoln (Capitol rotunda) and Admiral Farragut (Farragut Square, Washington)

**Hoy**, the second largest island of the Orkney group, Scotland, 2 m s w of Pomona or Mainland. At the southern end is a good natural harbor known as Long Hope. The Old Man of Hoy, an isolated pillar rock of yellow and red sandstone, with arches underneath, rises to 450 feet, p about 1,082

**Hoyle, Edmond** (1672-1769), English writer on whist and other games. He gave lessons in whist, and is mentioned by Fielding and Byron. His *Short Treatise on Whist* was long consulted as a standard, but his rules have now been superseded. He wrote also a book on *Quadrille, Piquet, Backgammon, and Chess* (1761)

**Hoyt, John Wesley** (1831-1912), American educator and administrator, took an influential part in reorganizing the University of Wisconsin, was governor of Wyoming Territory (1878-83), president of the University of Wyoming (1887-90), and a member of the Wyoming Constitutional Convention (1890). He was also special representative for foreign affairs at the World's Columbian Exposition, at Chicago (1903)

**Hrdlicka, Ales** (1869-1943), American anthropologist, born at Humpoletz, Bohemia. He studied in New York City, making a special study of the insane. He accompanied many expeditions of anthropologists to Mexico, Siberia, Peru, and Southwestern America



*The Old Man of Hoy*

In 1903 he became assistant curator of the American Museum of Natural History, later curator. In 1910 he became curator of physical anthropology of the Smithsonian Institution. In 1918 he founded and edited the *American Journal of Physical Anthropology*. He is the author of many scientific works

**Hroswitha, or Roswitha** (?935-?1000), German poet, was born of a noble Saxon family, and entered the Benedictine nunnery of Gandersheim, Brunswick, where she died. She

wrote eight metrical legends, including that of *Theophilus*, the mediæval *Faust*

**Hsianfu** See **Sianfu**

**Hsiang River**, an important affluent of the Yang-tse-kiang in Hu-nan, China, and one of the main routes to Kwang-tung from Central China

**Hsuan-tung** (1905), dynastic name of PRINCE PU YI of China, the son of Prince Ch'un See **CHINA, History**

**Huaina-capac**, **Huayna-capac** or **Ccapaca** (c 1450-1525), one of the great Incas of Peru, during whose reign the empire attained its greatest splendor

**Huambisas**, are a savage tribe of South American Indians, of Jivaroan stock, dwelling along the Marañon and Santiago Rivers, Peru

**Huancavelica**, or **Guancabelica**, a department of Peru, lying entirely within the Cordilleras The capital is Huancavelica It contains little land fit for agriculture The mountains are rich in minerals, p 230,000

**Huang-hsing**, or **Hwang-hsing** (1875), Chinese soldier In December, 1911, he was appointed Premier of the new Republic Later, he took a leading part in the rebellion against Yuan, and was expelled He visited the United States in 1914

**Huanuco**, or **Guanuco**, a department, Peru Capital, Huanuco Mining and agriculture are the chief industries, p 160,000

**Huaraz**, capital of Ancachs department, Peru, on the Huaraz River It has noteworthy ruins of the ancient Peruvians, p 15,000

**Hubbard, Bernard Rosecrans** (1888-), American priest, explorer, author, known as the 'Glacier Priest' because of his leadership of explorations into Alaska Besides many scientific studies and discoveries of buried sites of the Stone age villages, fossils, etc, he was the author and photographer of the film 'Amachak' and wrote *Mush You Malemutes!* (1932)

**Hubbard, Elbert** (1859-1915), American author and publisher He founded at East Aurora, N Y, an establishment called the 'The Roycroft Shop' for the publication of artistically printed and bound books, both new and reprinted He was also the founder and editor of *The Philistine*, a monthly magazine of protest He lost his life when the British steamship *Lusitania* was sunk by a German submarine during the European War (May 7, 1915) His publications include an extensive series of sketches of a biographical nature, known as *Little Journeys*, *A Message to Garcia* (1898), *Time and Chance* (1901)

**Hubbard, Thomas Hamlin** (1838-1915),

American lawyer and financier He practised law in New York City until 1894, when he retired to devote himself to railroad, banking, and other business enterprises He was an officer of the New York Commandery of the Military Order of the Loyal Legion, and an enthusiastic supporter of Arctic exploration, being president of the Peary Arctic Club

**Hubbard, William** (1621-1704), American historian, was for a short period president of Harvard College (1688) He wrote *General History of New England to 1680* (first published 1815), *History of the Indian Wars in New England to 1677* (1677, annotated by S G Drake, 1865)

**Hubert, St** (656-727), bishop of Liège was a son of Bertrand, duke of Guienne He lived a worldly life, first at the court of the Frankish king Theoderich, next under Pepin of Herstal, but after the death of his wife retired into a monastery In legend and in art, since the 15th century, St Hubert appears as a hunter who, when hunting on Good Friday, was startled into repentance by the appearance of a stag bearing between his horns a crucifix

**Huckleberry** (corrupted probably from *hurtleberry*, *whortleberry*, although the latter name is not commonly used in America), or **BILBERRY**, the term applied indiscriminately to a number of small shrubs, of the genus *Gaylussacia*, family *Vaccinaceae*, having a four to five celled many-seeded berry The species are numerous, and are mostly natives of the northern parts of the world

The shrubs range in height from the tiny *Vaccinium calypitum* to the *V pennsylvanicum* (about 3 ft) and the *V corymbosum* (sometimes 12 ft high) In New England canning huckleberries is an extensive and fairly profitable industry The fruits are all small and sweet, having a tough skin, black or blue, shining or with a bloom, and white, fleshy interior, with several seeds

**Hudde, Andreas** (c 1600-1663), Dutch colonial commander, was born in Holland He became surveyor in Manhattan (1642) In the archives at Albany are preserved voluminous reports written by him

**Hudson**, city, New York county seat of Columbia Co, on the Hudson River It extends along a high ridge ending in a bold promontory, at whose foot are the wharves There are manufactures of fire engines, paper, leather, foundries, and trade in tobacco, lumber, and cement It was settled in 1783, p 11,517

**Hudson, Erasmus Darwin** (1843-87), American physician, was health inspector of



New York City (1869-70), professor of medicine in the Women's Medical College of the New York Infirmary (1872-82), and in the New York Polyclinic (1882-87). His publications include *Doctors, Hygiene, and Therapeutics* (1877), *Physical Diagnosis of Thoracic Diseases* (2d ed 1887).

**Hudson, Henry** (d 1611), English navigator, of whom nothing certain is known before April, 1607, when he started on the first of two voyages for the Muscovy Company to discover a northeast passage to the East Indies. His most famous voyage was that of 1609, undertaken for the same object, but on behalf of the Dutch East India Company. He sailed from Amsterdam on March 25 in the *Half Moon*, of 80 tons burden, and with a crew of 18 or 20. He reached Nova Zembla, but the crew becoming quarrelsome, he turned westward and crossed the Atlantic Ocean, sighting land in the latitude of Nova Scotia. He then steered southward, and discovered the mouth of the river which now bears his name, and sailed up its waters for 150 m, to the present site of Albany.

Hudson sailed upon his last voyage in 1610, in the *Discoverie*, and reached Greenland. Steering westward, he discovered the strait now known as Hudson Strait, and passed through it, and entered the great body of water which has received the name of Hudson Bay. The practical results of Hudson's voyages were the establishment of the Spitzbergen whale fisheries and the Hudson Bay fur trade, and the settlement of New York by the Dutch. His name passed into the folk lore of the Hudson River, some of the popular beliefs concerning him and his exploits being embodied in the stories of Washington Irving.

**Hudson, Henry Norman** (1814-66), attained a prominent place among Shakespearean scholars, prepared an annotated edition of Shakespeare's *Works* (11 vols, 1851-6), and wrote many scholarly studies.

**Hudson Bay, or Hudson's Bay**, a great gulf or inland sea in the northeastern part of North America. The winter climate of the region is severe, the summer months are genial and bracing. The fur trade has been profitably carried on in the vicinity for centuries, but the agricultural possibilities of the soil, the rich mineral resources of the region, and the fish industry remain to be fully explored and developed.

Hudson Strait is about 450 m in length. It has no islands or rocks to hinder navigation, and never freezes over. The Bay is seldom frozen for more than a few miles from shore,

but both Bay and Strait are blocked with Arctic ice floes and bergs, which render navigation unsafe at certain times. An aerial and marine survey of ice conditions in the Straits was made in 1927 and 1928, it is expected that the use of airplanes as guides to ships navigating the Straits will materially reduce the risks.

Hudson Bay was discovered by Henry Hudson in 1610, and in 1670, by royal charter, the 'Governor and Adventurers of England, trading into Hudson Bay,' were granted 'the whole trade of all those seas, streights, and bays, rivers, lakes, creeks, and sounds.' During the French wars, with the exception of Fort Albany, it remained in French hands, being restored to the English in 1714.

**Hudson Falls** (formerly **Sandy Hill**), village, Washington co, New York. It has iron foundries and paper, saw and planing mills, p 6,654.

**Hudson River**, river in New York State, one of the most beautiful and important in America. It rises in the Adirondack Mountains near Mount Marcy, 4,322 ft above the level of the sea, its head streams being the outlets of many mountain lakes. In its upper course the river falls rapidly. Below Glens Falls it turns so to flow into New York Bay and the Atlantic Ocean. The total length is about 300 m, area of the river basin, 13,366 sq m. Below Albany, the river widens from one-half to one and one-half m, passes within view of the Catskill Mountains, enters the Highlands, which rise abruptly from the water to a height of 1,600 ft, widens to four miles at Tappan and Haverstraw Bays, and about 20 m above New York City reaches the Palisades, a perpendicular wall of rock 300 to 500 ft in height, which constitutes the chief beauty of the river. The principal towns and cities along its borders are Glens Falls in the n, Cohoes, Troy, and Albany near the mouth of the Mohawk, Hudson, Catskill, Kingston, Poughkeepsie, Newburg, West Point (seat of the U S Military Academy), Peekskill, Haverstraw, Ossining, Nyack, Tarrytown, and Yonkers along the lower course, New York, Hoboken, and Jersey City at its mouth. The Hudson supplies considerable water power in its upper part, and farther down has valuable fisheries. The river also furnishes the water supply of New York City through its tributaries, the Croton and the Esopus.

**History**—The history of the Hudson River begins with its discovery in 1524 by Verrazano, and its exploration in 1609 by Henry Hudson. The Dutch name of North River (to distin-

gush it from the Delaware or South River) is still retained on the west harbor front of Manhattan Island. During the American Revolution the Hudson, owing to its strategic importance, was the scene of the battles of Harlem Heights, Stony Point, and Peekskill, and witnessed the campaign of Burgoyne and the treason of Benedict Arnold. In 1807 Robert Fulton's first successful experiment in steamboat navigation was made on this river. The Fulton-Hudson Celebration was held in 1909, at which time the Palisades Interstate Park was dedicated.

Consult D. L. Buckman's *Old Steamboat Days on the Hudson River*, C. Johnson's *The Picturesque Hudson*, J. P. Farley's *Three Rivers: The James, the Potomac, the Hudson* (1910).

**Hudson River Vehicular Tunnel**, popularly known as the **HOLLAND TUNNEL**, connecting New York and New Jersey, the largest tunnel in the world for the exclusive use of motor-driven vehicles. The name was given to it in memory of Clifford M. Holland, who as chief engineer organized the engineering staff and successfully carried out the plans during the earlier years of construction. The best method of ventilation and the power to accomplish it were determined by a number of experiments carried on at the University of Illinois. As a final test of the question of satisfactory ventilation a model tunnel was constructed by the Bureau of Mines at Bruceton, Pa., and experiments were made as to the best way to introduce fresh and withdraw vitiated air.

The tunnel comprises twin tubes, one in each direction. Each is divided into three separate parts. They are lined with concrete and the walls tiled in white. The tunnel was first opened for operation November 13, 1927.

**Hudson's Bay Company**, a corporation formed in 1670 by Prince Rupert and 17 noblemen and gentlemen for importing into Great Britain furs and skins obtained by barter from the Indians of North America. The company was invested with the absolute proprietorship and the exclusive right of traffic over an undefined territory, which, under the name of 'Rupert's Land' comprised all the regions discovered, or to be discovered, within the entrance of Hudson Strait. Until the Treaty of Utrecht, in 1713, the Company was forced to contend against the French in Canada. Adventurers from the Great Lakes began to penetrate far up the Saskatchewan toward the Rocky Mountains, and their enterprises led

in 1783 to the formation of the Northwest Fur Company of Montreal. After a period of stubborn competition, the Hudson's Bay Company joined with its formidable opponent in 1821. Finally, in 1869, the Company made a formal cession to the British government of whatever territorial claims remained. Consult Laut's *The Conquest of the Great Northwest*, *Annual Reports* of the company.

**Hudson Strait**. See **Hudson Bay**.

**Huê**, walled city, capital of Annam, French Indo-China. The native city is surrounded by walls but the French quarters lie outside. In the native city is the Citadel which contains the king's palace, the residential quarter lies east of it. There are tombs of the old Annamite kings, and a museum of ancient Annamite art, p. 42,000.

**Hue and Cry**, a term used for the ancient English process of summary pursuit and arrest of a felon caught in the act. It was the duty of every lawful citizen to raise 'hue and cry,' and to join in it.

**Huelva**, province, Southern Spain, forming part of the ancient kingdom of Seville, p. 330,402. The Capital is Huelva, from which Columbus sailed in 1492.

**Huerta, Victoriano** (1854-1916), Mexican general, dictator, and president. When fighting broke out in the Mexican capital, in February, 1913, he was in command of the Federal troops, but later he combined with Gen. Felix Diaz to make Madero a prisoner and force him to resign. Huerta, being Minister of War, and the strongest man in sight, became provisional president. The United States Government refused to recognize his title. On July 15, 1914, he was forced to resign the presidency, and retired to Barcelona, Spain. In April, 1915, he took up his residence at New York. In July, 1915, he was arrested, charged with violating American neutrality, but he died at El Paso, Texas, on Jan. 13, 1916, before being brought to trial.

**Huesca** (Latin *Osca*), city, Spain, in Huesca province, on the River Isuela, 40 m. n.e. of Saragossa. It is an ancient city with interesting buildings, formerly a residence of Moorish kings and of those of Aragon, p. 12,500.

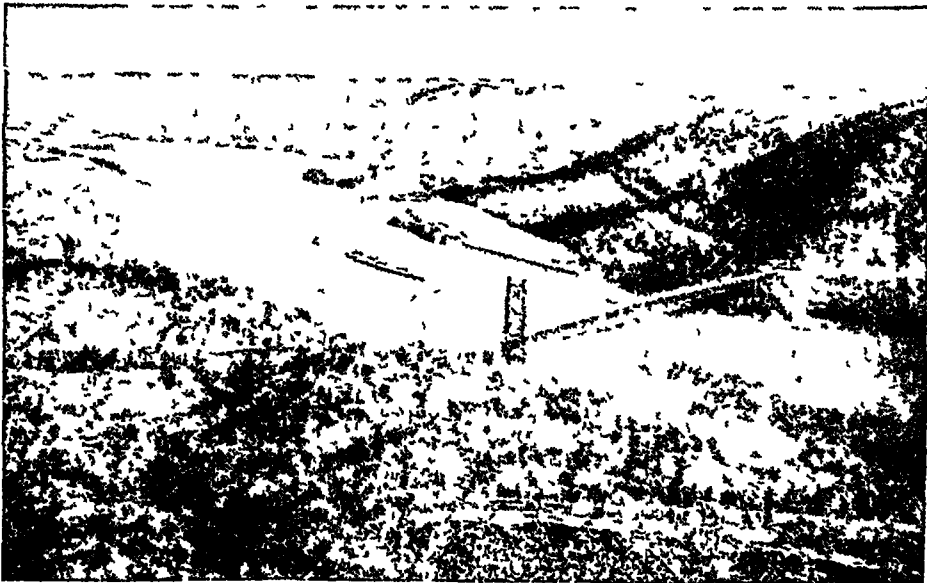
**Huggins, Sir William** (1824-1910), English astronomer, was born in London. Having in 1855 built an observatory at Upper Tulse Hill, by his own researches on the sun's spectra and the spectra of certain comets, he ascertained that their luminous properties are not the same. He photographed the ultraviolet parts of the spectra of the stars, and determined the amount of heat that reaches

the earth from some of the fixed stars. In 1868 he experimentally demonstrated the feasibility of applying Doppler's Principle to the determination of stellar velocities.

**Hughes, Ball** (1806-68), Anglo-American sculptor, was born in London. He studied with Edward H. Bailey, and in 1829 went to the United States. His statue of Alexander Hamilton, made for the New York Merchants' Exchange, and shortly afterward destroyed by fire, is said to have been the first portrait figure sculptured in the United States.

**Hughes, Charles Evans** (1862- ), American lawyer and public official, was born in Glens Falls, N. Y., and was graduated from

vision of the State military code, the investigation of speculation in stocks, the improvement of State banking legislation, employers' liability legislation, and the movement toward the establishment of direct primaries in the State. In May, 1910, he was appointed Associate Justice of the U. S. Supreme Court. In 1916 he was nominated for president. He was defeated and resumed his law practice in New York City. In 1921 he was appointed Secretary of State in President Harding's cabinet, a position he filled until 1925, when he returned to his law practice. He was chairman of the International Conference on the Limitation of Armament (1921), and in February,



*The Hudson River, from Bear Mountain Summit*

Brown University (1881) and Columbia Law School (1884). He practised his profession in New York City in 1884-01, again in 1893-1906, and in 1925-29. He was professor of law at Cornell University in 1891-3, and at the New York Law School in 1893-1900. He served as counsel for the Stevens Gas Commission of the New York legislature in 1905, and for the Armstrong Insurance Commission in 1905-06, and as special assistant to the U. S. Attorney General in the coal inquiry of 1906. His able conduct of these investigations, especially that involving the insurance companies, made him widely and favorably known, and led to his election in 1906 as governor of New York State, he was reelected in 1908. His administration was marked by the creation of the State public service commissions, the anti-race track gambling law, the re-

1930 was appointed by President Hoover Chief Justice of the Supreme Court to succeed William H. Taft, deceased.

His decisions caused him to be classed with the liberal members of the court. He voted with the majority in the celebrated five-to-four 'gold clause' decision in 1935, a finding which in effect absolved issuers of gold bonds from the obligation to redeem them in gold. He retired, June 1941.

**Hughes, David Edward** (1831-1900), Anglo-American inventor, invented the type-printing telegraph, which has been extensively employed in the United States and Europe, in 1878 the microphone and in 1879 the induction balance.

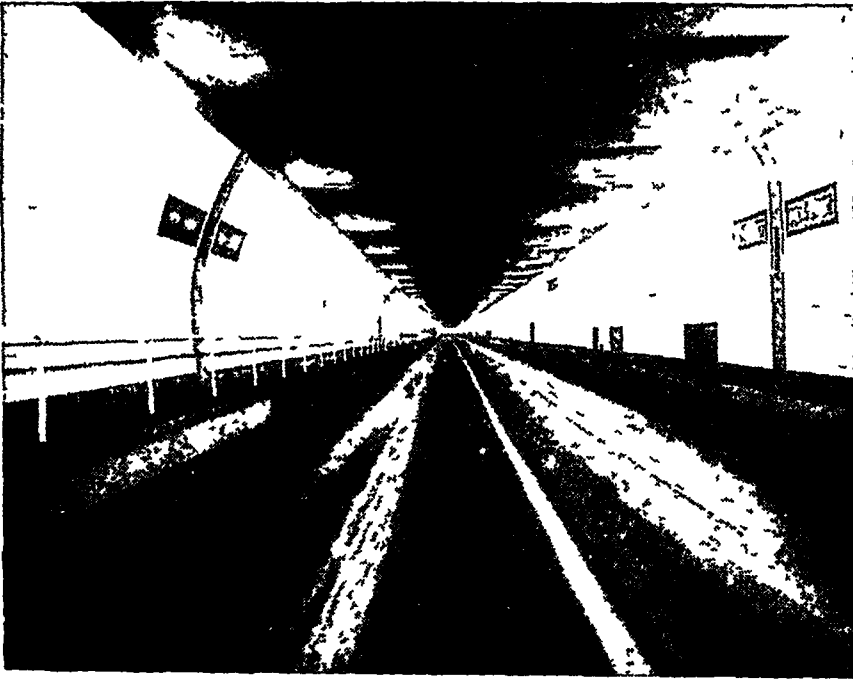
**Hughes, Edwin Holt** (1866- ), American bishop and educator. From 1903 to 1908 he was president of DePauw University.

and his books include *Thanksgiving Sermons*.  
**Hughes, Howard Robard** (1904- ), American aviator and cinema producer. Made world flight, 1938, in 3 days 19 hrs 17 min, 1937 flew across U S in 7 hrs 28 min 25 sec.

**Hughes, John** (1797-1864), first Roman Catholic archbishop of New York, was born in Annalaghan, County Tyrone, Ireland. He went to the United States in 1817. In 1838 he became coadjutor bishop of New York. In

**Hughes, Sir Samuel** (1853-1921), Canadian soldier and public official. In 1911 he became Minister of Militia and Defence in the Borden Cabinet and on the outbreak of the European War (1914) he had charge of the organizing of Canadian troops, of whom more than 300,000 were prepared for overseas service.

**Hughes, Thomas** (1822-96), English author, was born in Uffington. In 1848 he joined the Christian socialist movement under Mau-



*Hudson River Vehicular Tunnel*

1839 he was appointed administrator. In 1838 he founded at Lafargeville, N Y, a Roman Catholic seminary, which in 1841 was removed to Fordham, and became St John's College. In 1850 he became the first archbishop of New York. His *Complete Works* were published in 2 vols in 1865.

**Hughes, Rupert** (1872- ), American author and playwright. He is a prolific writer of fiction, and occupies a prominent position among living American authors. His works include *George Washington* (1926-30), a musical composition *Can* (1920), the play *Excuse Me*, and several motion pictures, *Attorney for the People* (1940).

rice and Kingsley, and was one of the founders and principals of the Working Men's College, London. He published, anonymously, *Tom Brown's School Days* (1857), which was an instant success, and *Tom Brown at Oxford* (1861).

**Hugh of Avalon, St** (?1135-1200), bishop of Lincoln, born at Avalon, Burgundy, and entered the Grande Chartreuse. Henry II of England installed him as prior of Witham monastery, Somerset, and thence promoted him to the see of Lincoln (1186). There he initiated numerous reforms, and was famed for charitable actions. Hugh was canonized in 1220.

**Hugh of Lincoln**, a boy of that city who is alleged to have been crucified (1255), by the resident Jews in mockery of Christ's death. The story was a favorite ballad subject, and supplies the framework of Chaucer's *Prioresses Tale*.

**Hugli, or Hoogly** (1) Capital of the district of Hugh, Bengal, India. Hugh is said to have been founded in 1537 by the Portuguese, p. about 29,383. (2) The most westerly of the deltaic arms of the Ganges, India, flows almost due s to Calcutta, and empties into the Bay of Bengal.

**Hugo, Victor Marie** (1802-85), the greatest among French poets, born at Besançon. Victor Hugo's true literary career began with the publication of his first volume of poetry, *Odes et Poésies*, in 1823, after which he was acknowledged as one of the most promising young literary men of the day. The year 1823 may be looked upon as the opening of the campaign between the romanticists and the classicists in France. Hugo, who at first professed to hold a middle place, was irresistibly pushed by his pre-eminence into the championship of the new romantic movement. It was as editor of *La Muse Française* (1823-4), that he first took part in the warfare which in 1830 he brought to a climax by putting on the stage his drama *Hernani*, even to this day almost Victor Hugo's most celebrated work. Its production created quite a tumult, amid which the piece was scarcely heard. Between 1830 and 1836 Hugo's fame rose to its highest point. He was friendly to the Orleanist dynasty, which came in with the revolution of 1830, and he was treated with great consideration by the court. In 1831 appeared *Notre Dame de Paris*, the most celebrated of his romances, and perhaps his finest prose work, and a volume of verse, *Feuilles d'Automne*, verses which express better than any, except *L'Art d'Être Grand-père*, the domestic and tender sentiments of the poet. In the same years was played *Marion Delorme* (or *De Lorme*), which had been forbidden by the censor under the previous dynasty. *Le Roi s'amuse* followed in 1832, the best-motived perhaps of all Victor Hugo's plays, oftener seen in its operatic guise, *Rigoletto*, than as a drama. *Lucrèce Borgia*, Hugo's next play, had a greater initial success than any of his other pieces. Howbeit, in *Voix Intérieures* and *Les Rayons et les Ombres* we have the writer in a new mood—a subdued state of reflection, not one of declamation as heretofore. Though, or because, he was the acknowledged leader of

young literary France, Hugo was refused admission to the Academy in 1836, and not elected till 1841. Surviving for one tragic event which greatly influenced his thought and verse—namely, the death in a boating accident of his newly married daughter Leopoldine, and of her husband Charles Vacquerie—the poet's biography from this time to 1845 consists chiefly of the list of his productions: two dramas, *Ruy Blas* (1838) and *Les Burgraves* (1843), and a large book of travels and history, *Le Rhin* (1841). But the *coup d'état* (Dec, 1851), against which Hugo made vain efforts to raise the people, turned him into an exile and a convinced republican, tending, as the years went on, more and more towards socialism. In 1852 appeared his attack on the emperor, *Napoléon le Petit*, which was followed a year later by the *Châtiments*, a series of poems as bitter as were ever written. Victor Hugo at first made his home in Jersey, in 1855 he moved to Guernsey, and lived at Hauteville House. For fifteen years he remained an exile in the island, and only returned to France after the fall of the empire in 1870. After *Châtiments*, the chief literary events are—the beginning of *La Légende des Siècles*, which without doubt, from its originality in form of versification and in the choice of rhymes, constitutes an epoch in the history of French poetry, the publication of *Contemplations*, one of his very finest works (part had been written long before), and the publication of those novels or romances of modern life of which *Les Misérables* (1862) is the most celebrated, others being *Les Travailleurs de la Mer* (1866), *L'Homme qui Rit* (1869), and *Quatre-vingt-treize*, written in France after his return, the last two being in a sense historical stories. They are examples not only of the immensely wide range of the writer's powers—versatility is too slight a word to use—but of his new outlook upon life, and his predilection for the poorer classes.

After his return to Paris in 1870, Victor Hugo reigned as the undisputed sovereign and, as it were, father of contemporary French literature. But only one or two more works from his pen of the first importance were to see the light. One of these is *L'Année Terrible*, a series of lyrics—as they must be called—arranged in an epic manner, and all illustrating the sufferings of Paris during the siege, and he also wrote his charming *L'Art d'Être Grand-père*, which perhaps more than any thing of Victor Hugo's made for his popularity with the middle class public.

In French literature Victor Hugo takes a place analogous to, if far behind, the place which is held by Shakespeare in England and Goethe in Germany

**Huguenot Society of America**, an association of descendants of Huguenot ancestors, founded in 1883 with headquarters in New York

**Huguenots**, the name generally given to the French Protestants of the 16th, 17th, and 18th centuries. The turning-points in their history were—(1) the outbreak of the civil religious wars in 1562, (2) the Edict of Nantes, by which toleration was guaranteed to them in 1598, (3) the revocation of the Edict of Nantes by Louis XIV in 1685. They were placed on a footing of perfect equality with the rest of the population by the revolution of 1789. Large numbers emigrated to America, especially to New York.

**Huia** (*Heteralocha acutirostris*), a New Zealand bird in which there is remarkable sexual dimorphism. The plumage is greenish black, the tail being tipped with white. The bird is allied to the crows of the family Corvidae.

**Huila**, volcanic mountain peak, Colombia, in the central Cordilleras, about 60 m n e of Popayan. It is about 17,700 feet, snow-clad, and constantly emits smoky vapor.

**Huitzilopochtli**, the Aztec war god. Though theoretically subordinate to the supreme deities, the sun and the moon, in reality he was at the head of the Aztec pantheon. Huge images of him have been excavated in various parts of Mexico.

**Hull**, more correctly **Kingston-upon-Hull**, city and county, England. The docks extend along the river front for nearly seven m and cover a water area of about 200 acres. The leading industries are shipbuilding, and fisheries. During the war it was frequently raided by Zeppelins. The town was named Kingstown by Edward I in 1293. Until late in the 19th century it was the headquarters of a whale fishery, p 313,636.

**Hull, Cordell** (1871- ), American cabinet officer. Born in Tennessee, where he was admitted to the bar in 1891, he represented his state in the House of Representatives for six terms, being elected to the Senate in 1931. Two years later he became Secretary of State in the cabinet of President Roosevelt.

He was chairman of the Democratic National Committee, 1921-1924, and chairman of the American delegation to the London Monetary and Economic Conference (1933). In Congress he was author of the federal

income tax system of 1913 and the Federal inheritance act of 1916. His name has become associated with the 'Good Neighbor' policy. He was Secretary through World War II, resigning in Dec 1944 on account of illness. One of his last official acts was the signing of the United Nations Charter.

**Hull, Isaac** (1773-1843), American naval officer. During the War of 1812 with Great Britain he distinguished himself by his expert seamanship. Later he was in command of the Boston and the New York navy yards.

**Hull, William** (1753-1825), American soldier, served with distinction throughout the Revolutionary War, taking an active part in the battles of White Plains, Trenton, Princeton, and others. He was governor of Michigan territory from 1805 until the outbreak of the War of 1812, when, with the rank of brigadier general and at the head of a force of about 2,200 he attempted the invasion of Canada, but he almost immediately withdrew to Detroit, which place he soon surrendered to the British (Aug 16, 1812) without resistance. He was tried by court-martial, was found guilty of neglect of duty, and was condemned to death, but was pardoned by President Madison.

**Hull House**, a famous social settlement in Chicago, Ill. In 1889 the building, which had been erected by Charles Hull, was leased by Jane Addams and Ellen Starr as a home for a social settlement similar to Toynbee Hall, London. In its early days its activities were purely social but they were gradually extended to cover phases of the economic life of the district and it finally came to be identified with the labor movement.

**Humanists**, the name applied to the scholars and advocates of the new learning which spread over Europe after the fall of Constantinople in 1453. Owing to the fact that the new learning was classical and literary, the movement tended to be considered pagan without being declared anti-Christian or even anti-papal. Some of the most distinguished humanists were Poggio, Petrarch, Bembo, Erasmus, Ulrich von Hutten, Sir Thomas More, and George Buchanan, and among moderns, Irving Babbitt.

**Humber**, estuary, on the e coast of England, between Yorkshire and Lincolnshire, formed by the Ouse and the Trent.

**Humbert I** (1844-1900), king of Italy, eldest son of Victor Emmanuel II. His visit to Vienna in 1881 secured for Italy admission to the Triple Alliance, but the failure of the Italian troops in Abyssinia and heavy taxa-

tion in later years caused him the loss of some of his popularity. He was mortally shot by an anarchist named Bresci.

**Humble-bees**, or **Bumble-bees** (*Bombus*); a group of bees displaying less perfection of social life than their ally the hive-bees. Humble-bees are distinguished by their large, egg-shaped bodies, thickly covered with hair. They are found in all parts of the world except Australasia, where they have been introduced in order to grow clover, which depends mainly on the cross-fertilization effected by these insects. Consult Kellogg's *American Insects*.

**Humboldt**, a large glacier in Greenland, in the northern part, near Rensselaer Harbor. It is one of the largest in the Arctic regions, and stretches north some fifty miles.

**Humboldt**, lake, Nevada, in Pershing and Churchill Counties. It is about 20 m long and 8 m wide and at certain seasons of the year is little more than a marsh.



Victor Hugo

**Humboldt**, mountain range, Nevada, in Pershing co., in the western part of the State.

**Humboldt**, river, Nevada, rising in Elko co. and flowing in a southwesterly course of 350 m into Humboldt Lake. Its waters are somewhat saline.

**Humboldt**, Friedrich Heinrich Alexander, Baron von (1769-1859), Prussian naturalist and traveler, was born at Berlin. He sailed with Bonpland for the Spanish states

of South America in 1799, where they explored the course of the Orinoco, and proved its connection with the Amazons, sailed up the Magdalena, crossed over the Andes, and descended on the other side to the sources of the Amazons, then, after a year spent in Mexico and the U S, the two returned (1804) to Europe. His principal occupation from 1845 down to the time of his death was the composition of the classic *Kosmos*, a summary and exposition of the laws and conditions of the physical universe. The results of his great journey were published in 30 vols., divided into six separate sections, under the general title, *Voyage aux Régions Equinoxiales du Nouveau Continent, fait en 1799-1804*.

**Humboldt**, Karl Wilhelm, Baron von (1767-1835), Prussian statesman and writer, elder brother of the above, was appointed successively minister in Rome (1802), minister of education in Prussia (1808)—it was he who founded the University of Berlin—ambassador at Vienna (1812), and Prussian plenipotentiary at the Congress of Prague (1813). Subsequently he took part in the Congress of Vienna (1814-15). But in 1819 he devoted himself to literature, mainly to comparative philology and the philosophy of language. His *Gesammelte Werke* were edited by his brother Alexander in 1841-52. See the *Life* by Haym.

**Hume**, David (1711-76), Scottish philosopher and historian, born at Edinburgh. In 1734 he went for a time to France, and there wrote the important *Treatise of Human Nature*. Hume then turned his pen to subjects of more general interest, and in 1742 published *Essays—Moral, Political, and Literary*. Two other philosophical works were published about this time—the *Inquiry concerning Human Understanding* in 1748, and the *Inquiry concerning the Principles of Morals* in 1751, and another volume of essays, the *Political Discourses*, followed in 1752. With the exception of his *Natural History of Religion*, his literary activity was mainly concentrated on his *History of England*. His *Dialogues concerning Natural Religion* were published in 1779. The philosophy of Hume was an extreme and thoroughgoing development of the sensationalism that was latent in Locke's account of the origin of knowledge. See also his *Autobiography* (edited by Adam Smith 1777), and Burton's *Life and Correspondence of David Hume* (1846).

**Hume**, Martin Andrew Sharp (1847-1910), English historical writer, born in London, was principally known for his political

and diplomatic histories of the Tudor period, and for his numerous works on the history of Spain

**Humeral Veil**, a cape or covering for the shoulders In ecclesiastical ritual, the humeral veil is an oblong silk vestment worn over the shoulders during various ceremonies, also covering the hands when the officiating priest holds the sacred vessels The humeral veil was also worn by the Jewish priest on the shoulders, and was fastened to the breastplate

**Humidity**, the state of the atmosphere with relation to the vapor that it contains it is said to be high when the air is damp and low when the air is dry Cold as well as heat is more easily borne by the human subject when the air is dry The quantity of vapor present at the time of observation is called the *absolute* humidity, this being expressed either in the expansive force exerted by the vapor, or in its weight in grains per cubic foot of air The *relative* humidity is ascertained by dividing the amount of vapor that might exist if the air were saturated by the absolute humidity In the U S the relative humidity varies from a mean annual of 38.7 per cent for the very dry region of Phoenix, Arizona, to 82.9 per cent for Hatteras, N C, and 82.1 per cent for Nantucket, Mass The instrumental measurement of humidity is discussed at **HYGROMETER** See tables of U S Weather Bureau

**Hummel, Johann Nepomuk** (1778-1837), Hungarian pianoforte composer and player, perhaps Mozart's most talented pupil, was born in Pressburg His numerous compositions (rondos, sonatas, studies, and church music), though now largely forgotten, were formerly in high repute, for in his prime Hummel was regarded as the equal of Beethoven

**Humming birds** take their name from the sound made by the wings during flight Their food consists of the insects found in flowers, and not, as was formerly supposed, of nectar

Humming-birds constitute the family *Trochilidae*, and include the smallest known birds, but one form (*Patagona gigas*) reaches a length of eight and a half inches Among their structural characters may be noticed the compressed head and slender and pointed bill The colors are especially brilliant in modified tufts of feathers which occur as crests, gorgets, ear-tufts, beards, and so on The common and only one of the eastern United States is the ruby-throat (*Trochilus Colubris*) Consult Gould's *Monograph of the Trochilidae*, magnificently illustrated, and Ridgway's *The*

*Humming-birds* (Smithsonian Institution, *Annual Report for 1890*)

**Humperdinck Engelbert** (1854-1921), German musical composer, was born in Seiburg He ranks with the young Wagnerians, and was closely associated with the family of the Master, whose son Siegfried he taught The opera, *Hansel und Gretel*, produced (with his sister as librettist) at Weimar (1893), brought him a European reputation, and it is upon this that his fame chiefly rests

**Humphreys, Andrew Atkinson** (1810-83), won particular distinction by his surveys with Henry L. Abbott, of the Mississippi river, their *Report upon the Physics and Hydraulics of the Mississippi River* (1861, new ed 1876), being considered one of the most valuable scientific and engineering reports ever issued by the U S Government

**Humphreys, David** (1752-1818), American soldier, diplomat, and writer, served in the Revolutionary War as an aide to General Washington from 1780 until the close of the war He was U S Minister to Portugal (1791-7), and to Spain (1797-1802)

**Humphreys, Joshua** (1751-1838), American naval architect, built, among other ships, the *Constitution* He is sometimes called 'the father of the American Navy'

**Humphreys, William Jackson** (1862), American physicist, became a professor of meteorological physics at the U S Weather Bureau (1905), and in George Washington University (1911) He was director of the research station at Mount Weather, Va, from 1905 to 1908

**Hun, Henry** (1854-1924), American, neurologist, was born in Albany, N Y He was associated as consulting and attending physician with various hospitals, and was president of the American Neurological Association He published *Guide for American Medical Students in Europe*, and *Differential Diagnosis of Nervous Diseases*

**Hunan**, province of Central China, is broken up into valleys divided by low-lying hills, and is bounded e, s, and w by mountains rising from 3,000 ft to 6,000 ft The Hsiang and Yuan rivers are the chief commercial routes to the provinces of Kwangtung and Kweichow A very extensive coal field (anthracite and bituminous) lies to the e of the Hsiang Immense quantities of tea are exported annually The population is hardy, independent in character, and until recently was very anti-foreign, Hunan being the last province to permit missionary activity The ab-



original tribes, which exist in the s w , are not under Chinese control Changsha, the capital, has a population of over 500,000, p of province 20,000,000

**Hunchback**, or **Humpback**, a deformity arising in consequence of abnormal curvature of the dorsal portion of the spinal column The slighter degrees of the deformity may result from lateral curvature, which again is caused by such conditions as obliquity of the pelvis from the shortening of one leg, contraction of one side of the thorax following empyema, unilateral muscular action from paralysis of opposing muscles, or the habitual one-sided position of the body frequently assumed by delicate children who are growing rapidly Rickets and struma are also important factors in the causation of the condition

A graver condition is the deformity arising from Pott's diseases, or, as it is called, 'angular' curvature, which is due to inflammation and necrotic destruction or caries of the anterior parts of the vertebral bodies and inter-vertebral discs After the necrosed parts have been cast off by abscess formation and the inflammation has subsided, the adjacent vertebrae above and below the seat of disease become fused together by cicatricial tissue, so that the upper part of the spine is bent forward at an angle proportionate to the amount of bone destroyed Another cause of hunchback is chronic rheumatic arthritis

**Hundred** The primitive administrative and judicial district in England, generally superseded in later times by the more complex organization of the kingdom into counties, parishes, towns, and boroughs

**Hundred Days**, *The*, a name often given to the period between Napoleon's arrival in France on March 1, 1815, after escaping from Elba, till his defeat at Waterloo on June 18 of the same year

**Hundred Years' War**, the struggle between France and England from 1337 to 1453, interrupted by intervals of peace By the year 1453 the English were driven from France, and Calais was all that remained to them See *FRANCE History*

**Huneker, James Gibbons** (1860-1921), American music critic, was born in Philadelphia He taught in the N Y National Conservatory of Music (1886-96) He became editor of the *Musical Courier* in 1892, was music critic on the *New York Sun*, *Times*, and *World*, and contributed to London, Paris, Vienna, and Berlin journals His writings include *Mezzotism in the Modern Music* (1899),

*Chopin* (1900), *The Melomaniacs* (1902), *Ivory, Apes, and Peacocks* (1915), *The Philharmonic Society* (1918), *Variations* (1921) Consult *Letters of James Gibbons Huneker* (1922) by Josephine Huneker

**Hungarian Confession**, *The*, adopted by the Reformed Church of Hungary at the Synod of Czenger (1558), is a Presbyterian or Calvinistic Confession of Faith It rejected Anabaptism and the anti-Trinitarian views contained in the Roman Catholic and Lutheran doctrines of the Eucharist

**Hungarian Wines** are of a varied type The more important are the different brands of Tokay, both dry and sweet

**Hungary** (*Hung Magyarország*), a republic since 1946, prior to World War I (1914-19) one of the members of the Austro-Hungarian Empire, lies e of Austria, with former Czechoslovakia on the n, Rumania on the e and s, and Yugoslavia also on the s Before the war it embraced Hungary proper, Croatia-Slavonia, and the city of Fiume, and had a total area of 125,649 sq m Its dominions were reduced, following the War, by the loss of Fiume, of Croatia and Slavonia to the Yugoslavs, and of Transylvania to Rumania, and by a general readjustment of its other boundaries

On the n, e, and s e, Hungary is encircled by the Carpathians, while in the w and s w, the extreme outlying ramifications of the Alps stretch into the country as the Bakony Wild (2,000 ft) The characteristic feature, however, is the great central plain of the Alföld, some 37,500 sq m in extent The greater part consists of wide, open, treeless steppes called *pusztas*, where graze vast herds of horses, cattle, buffaloes, sheep, and swine, but many acres have been converted to the plough, the soil being excellently adapted for the growing of wheat In the w, between the Little Carpathians and the Bakony Wild, there stretches a smaller plain, some 4,500 sq m in area, and very fertile The Danube, navigable in its entire course through Hungary, follows along former Czechoslovakia to a short distance, above Budapest, where it turns and runs due south to the southern boundary

Owing to the protection of the Carpathian girdle on the n and e, and its open situation towards the s, Hungary enjoys a relatively mild climate The rainfall varies greatly in different localities Generally speaking, it is low, and droughts are frequent Fishing in the rivers and in Lake Balaton is good, and carp, sturgeon, barbel, salmon, and trout form a

part of the food supply Hungary lost much of its mineral wealth by the terms of the Peace Treaty, but extensive iron mines remain in the e and n, and coal and lignite are mined in great quantities. The greater proportion of the population is engaged in agriculture. Cereals are the chief crop, and tobacco, potatoes, sugar beets, hops, fruit, and flax are important. Hungary has long been famous for its wines. The rearing of silkworms and of bees is carried on, and horse breeding is profitable, Hungarian horses, famed for speed and endurance, being much in demand. Textile works, paper making, flour milling, and sugar refining are the chief industries.

Hungary's trade is largely with Germany and with Austria, Czechoslovakia. The diverse racial elements in Hungary were long a menace to the stability of the country. The dominant race is the Magyars or Hungarians. The Rumanians formed a pretty compact mass in the e and ne and Transylvania, amounting to about 15 per cent of the total population. Germans and Slovaks predominated in the n and nw. There was a strong Ruthenian element in the ne. Croats and Serbians made up only 3.8 per cent, but in Croatia-Slavonia almost the entire population was of Croato-Serbian blood. There were also some 80,000 gypsies. Under the Peace Treaty (the Treaty of Trianon) terminating World War I, the territories occupied largely by Rumanians, Slovaks, and Croats and Serbs were assigned to Rumania, Czechoslovakia, and the Yugoslav Republic respectively. The principal cities are Budapest, the capital (1,586,000), Szeged (110,000), Debreczin (103,000).

Over half the population belongs to the Roman and Greek Catholic Churches. The educational system is similar to that of Austria. The Constitution of Hungary as a kingdom dates from the year 1000, and the first charter from the Golden Bull of 1222. The constitution was in abeyance from 1849 to 1860, but existed in full validity from 1867 to the revolution in 1918. The Government of Hungary since the close of World War I has been in an extremely unsettled state. A republic was proclaimed Nov. 16, 1918, this was succeeded by a soviet government, and thus by a government headed by a Regent, and again by a republic. Attila and his Huns had held the fertile plain in the 5th century A.D., the Gepidae in the 5th and 6th centuries, the Avars in the 7th and 8th, the Slavs in the 8th and 9th. The remnants of these races the Magyars

swept away to the mountainous verge of the plain, establishing themselves on the Theiss under the sovereignty of Arpad.

Christianity and monarchy reached Hungary together in the person of Stephen, saint and king (1000-1038), from whom Hungary received a constitution combining Roman centralization with German autonomy, each county being governed from a local center, while the country was legislated for in the National Assembly or Diet. In 1222 the Golden Bull, or Magna Charta of Hungary, was signed by Andrew II (1205-35), as since by each successive sovereign, including the Hapsburgs. By the death of Andrew III in 1301 the House of Arpad became extinct, and the throne of Hungary became an object of rivalry between various foreign potentates. After many vicissitudes, Hungary was fortunate enough to find a worthy king in the person of Charles Robert of Anjou (1308-42), who did much to place his adopted country on a level with more civilized western nations. From the Arpad dynasty to the Hapsburgs eleven kings ruled, Louis I of Anjou (1342-82) being the most formidable continental European monarch of his time. Then followed the struggle with the Ottoman invasion. In 1526 the Turks, under Solymán the Great, annihilated the Hungarian forces at Mohács, pillaged whole districts, and carried off some 30,000 Hungarians as slaves. Louis II himself lost his life in or after the battle of Mohács, and the Hungarian throne became once more the prize of contention between two claimants. For some hundred and fifty years the Turks were masters in two-thirds of the Hungarian counties, from which they were driven (1683) by John Sobieski, king of Poland, and Leopold of Austria. But Hungary had only changed masters, and was never lower than after the peace of Karlowitz (1699). As long as the Napoleonic wars lasted, the Hungarians supplied money and troops to the Austrian army and took their share in combating the French Republic and empire.

The narrow-minded policy of Metternich and the whole court party drove the Hungarians into political revolt, which culminated in an armed rebellion in 1848. Under Kossuth the Austrians were driven out of Hungary, but owing to the intervention of Russia, the Magyars surrendered at Világos in 1849, and Hungary was incorporated into and governed as an hereditary province of Austria. Gradually, however, better counsels prevailed at the court of Vienna. Parliament was again sum-

moned in 1865, and the demands of the Hungarians, as formulated by Deák and his party, were complied with Francis Joseph was crowned king of Hungary, June 7, 1867, and entered on the faithful discharge of his duties as constitutional monarch

The outbreak of the World War in 1914 seemed for a time at least to unite Austria and Hungary, but as hostilities progressed the various subject races became increasingly restless, and affairs were more and more disturbed Francis Joseph died on Nov 21, 1916, and in May 1917 Count Tisza, prime-minister since 1913, resigned because of a disagreement with the franchise reform policy of the new king,

forces on the eastern battle front during the first two years of the war, assumed control of affairs

The Archduke's government, however, was not recognized by the Peace Conference, and on Aug 22 his withdrawal was announced On Aug 28 Stephen Frederick, premier under the archduke's *régime*, formed a new cabinet Frederick was succeeded by Karl Huzzar, pending the meeting of the National Assembly, and during his ministry the Treaty of Trianon was signed, whereby peace was established and Hungary lost more than two-thirds of its former territory Great groups of Hungarians became subjects of neighboring

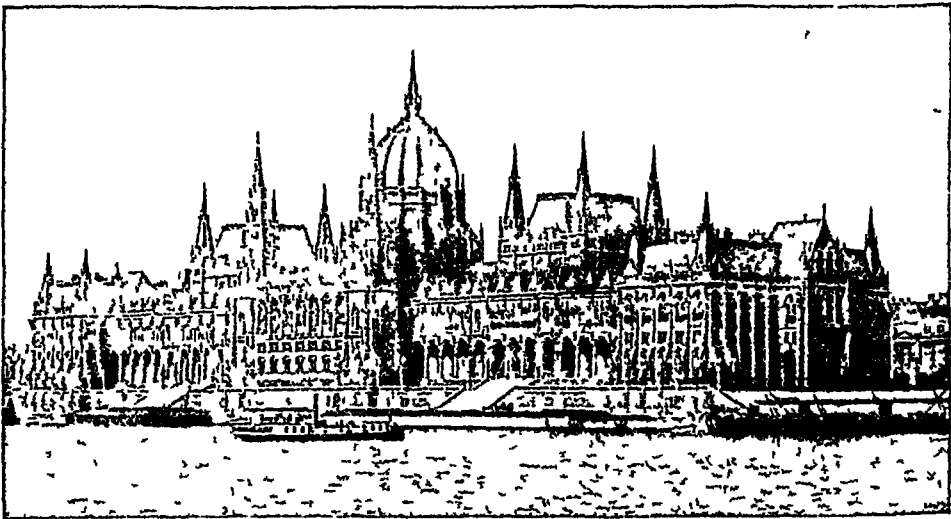


Photo by Ewing Galloway, N Y

Hungary Parliament Building, Budapest

Charles IV In the meantime the Hungarian Parliament had adopted a resolution declaring Hungary's independence of Austria Count Michael Karolyi, who had been named Premier on Oct 31, assumed control, and the Hungarian People's Republic was formally proclaimed Nov 16, 1918 A second revolution, more radical than the first, occurred in March, 1919 A soviet republic was at once established, with Alexander Gombas as Premier and Bela Kun as Minister of Foreign Affairs, and steps were taken for the immediate socialization of the large estates, mines, industries, banks, and transport lines Growing opposition to the radical measures that had been adopted, and the serious food situation, led to the downfall of the government Bela Kun resigned on Aug 1, 1919 Archduke Joseph, who had commanded the Austro-Hungarian

countries, statues in Budapest were veiled to mourn the lost soil Conditions in Hungary at this period were extremely unsettled 1921 was marked by an attempt of the former emperor, Charles of Hapsburg, to regain the Hungarian throne By order of the Council of Ambassadors, he was exiled to the island of Madeira, off the west coast of Africa where he died April 1, 1922 Admiral Horthy was appointed Regent, and a cabinet was formed by Teleki, succeeded by Count Bethlen as Premier and semi-dictator

A separate peace between Hungary and the United States was ratified Dec 12, 1921, and on Sept 18, 1922, Hungary was admitted to the League of Nations By the early summer of 1923 the economic situation in Hungary had become so serious that Count Bethlen appealed to the Reparation Commission, then

meeting, for permission to raise a foreign loan. Certain economic reforms were required of Hungary, and Jeremiah Smith, Jr., an American, was appointed Commissioner General of the League to supervise the execution of the plan. The loan was immediately raised, and evidence of economic recovery was soon apparent.

The solving of the internal situation was brought about from 1922 to 1926 by the cabinet and fully representative parliament formed by Count Bethlen, succeeded in 1931 by Premier Gombos. But Hungary's relations with her neighbors, after the Treaty of Trianon, remained strained and involved. To the s and w was Yugoslavia, Roumania was on the e, Czechoslovakia on the n. These countries became known as the 'Little Entente' whose purpose was to maintain the boundaries of the Treaty. The 'ring' was broken only by a stretch of Austria on the w, generally friendly. Since 1921, Yugoslavia has been the neighbor most troublesome to Hungary. To counteract the friendly relations France maintained with the Little Entente, Hungary from 1922 on cemented friendly agreements with Italy and Austria-Hungary accused Yugoslavia of breaking a Trade Treaty and fostering border trouble, Yugoslavia brought formal charges against Hungary at Geneva in 1934, accusing her of fomenting a conspiracy of the Croats under Pavelitch, supposedly culminating in the murder of Alexander, King of Yugoslavia.

When Hitler blotted out the national existence of Czechoslovakia, 1938-39, he allowed Hungary to seize the Carpatho-Ukraine province of that country as well as a slice of Slovakia. This increased Hungary's area to some 45,000 square miles and her population to about 10,500,000. In 1940 with Germany's aid a large slice of Rumania was added to Hungary but in 1941 the country was under complete domination of German Nazis. A puppet government was set up, with Field Marshal Sztójay as Premier, in 1944 Col. Lakatos became Premier. Admiral Horthy, the Regent under the earlier monarchy, was retained by the Germans, but Nazi enthusiasts ousted his last-named Premier and named Szalasy. In 1946 the Third Hungarian Republic was founded.

**Hungary Language and Literature**  
The Hungarian language, together with Vogul, Ostiak, Sryenian, Votjak, Lapp, Finnish, Mordvin, Cseremiss, forms Ugrian tongues. Of Ugrian group, Hungarian most resembles Finnish, Lapp, Turkish.

**Hungarian Grammar** of Ignatius Singer (1882)

Hungarian literature dates chiefly from 1780, yet there are more than 5,000 Magyar authors. Latin was more in use than the national idiom in the 18th and the first quarter of the 19th century, and French, German, English, and Italian were widely read and studied. Hungarians, too, such as J. L. Klein and Charles Beck, wrote and ranked as foreigners. But since 1832 the literature of Hungary has reflected the growth of national life and feeling. The years 896-1772 may be termed the period of growth. Foreign scholars (Anton Bonfini, Marzio Galeotti), a new university (that of Pozsony, with the Corvina library), a printing-press at Buda (1473), and a translation of the Bible by Caspar Karolyi, all aided in the production of an ever-increasing literature. The first Hungarian drama, *The Marriage of Priests* (*a papok hazas saga*), by Michael Sztarai (1550), the still popular *Argirus Kiralyfi* by Albert Gergei, *Flower Songs* (*Virag-énekek*), by Balassi (1551-94)—discovered only in 1874—author of the Balassi stanza, are notable. *The Venus of Murany* (1664), written in Alexandrines by Stephen Gyongyossi, the *Kurucz* (political) ballads, and chronicles by John Szalardi, should be added as of importance. From 1711-72 there is little to record save heavy learned works, and French and German translations. Inspired by Count Stephen Szechenyi and the liberal and patriotic party, Hungarian literature entered its latest and triumphant phase. In 1830 the Academy, in 1837 the national theatre at Pest, were founded.

Szechenyi drove Latin from the Diet by a daring speech in Magyar, and the imperial lips spoke Magyar from the throne. A mere indication of authors follows. Poets: Charles Kisfaludy (1788-1830), Michael Vorosmarty (1800-53)—the National Hymn, *Szozal* (1837), Gregory Czuczor (1800-66), Alexander Petofi (1823)—*Rise, O Magyar*, *Talpra Magyar* (1848), John Arany (1817-82)—*Toldi Trilogy*, *Capture of Murany*, *Michael Tompa* (1817-68)—*Flower Fables*, *Viragregék*. Novelists: Nicolas Josika (1794)—*Abafi*, *The Bohemians in Hungary*, Joseph Eotvos (1813)—*The Carthusians*, *The Village Notary* (1845), Sigismund Kemeny (1875)—*Gyulai Pal*, *Rough Times* (1862), Maurus Johai (1825-1904), who wrote more than 250 novels—among them, *A Hungarian Nabob* (1856), *Love's Fools*, *The Golden Era of Transylvania*. Since 1848 a great dramatic revival has produced Katona (1830), Banus

*Bank*, Edward Szigheti (1814-78), folk-dramas, Charles Hugo Bernstein (1817-77), *Banker and Baron*, Gregory Csiky (1842-90) Critic Joseph Bajza (1804-58) See *Hungarian Anthology*, by P. Tabor (1943)

**Hunger** is a recurring painful sensation due to the organic need for food. Normally, hunger immediately disappears when sufficient and suitable food enters the stomach. Hunger is not essentially or strictly periodic, but the times of recurrence may be made regular by training. These in general follow the rate of digestion. From the evolution standpoint, hunger is a phase in the rhythm of nutrition, a sequel to assimilation, it is the organic index of incipient death, and therefore becomes the fundamental motive to individual self-preservation.

**Hunnen-Betten**, or **Hunne-Beds**, the name given to a series of megalithic curns, akin to dolmens, situated in the Netherlands, almost exclusively in the province of Drenthe. They resemble the 'giants' graves' of other parts of N. Europe. See Fergusson's *Rude Stone Monuments* (1872), and Munro's 'Megalithic Monuments of Holland,' in *Proc Soc Antiq Scot*, vol. xviii.

**Huns**, a people of Tartar or Ugric stock, who in the 3d century B.C. seem to have dominated the whole of N. Asia, from the Ural Mts. to the Straits of Korea, and the famous Great Wall of China was erected at this time to check their incursions. When the Huns first appeared in Europe remains a matter of conjecture, but crossing the Volga, they overthrew the kingdom of the Alans about 374, and pressed on at once to the conquest of the Gothic empire.

Supreme between the Danube and the Volga, the Huns successfully invaded Persia, terrorized Syria, and threatened Italy, and in 446 Attila was in a position to dictate to the Byzantines a treaty by which they surrendered a part of their territory, paid an immediate indemnity of six thousand pounds weight of gold, and agreed to pay two thousand one hundred annually to the suzerain Attila. Four years later he simultaneously declared war against the empires of the East and the West. At Châlons-sur-Marne, east of Paris, was fought, in 451, the great battle which at length broke his mighty power. In this momentous engagement Attila's immense army, estimated at half a million of men, was defeated by the combined armies of the Romans and the Visigoths, under Ætius and Theodoric. In the following spring, however, Attila launched himself upon N. Italy, whose cities

he devastated and plundered. But all further schemes of conquest were effectually put a stop to by his sudden death in 453.

For several centuries the Huns continued to figure in European history, their home being chiefly in the Danube region, whence they issued to battle with Charlemagne, and, in the 9th and 10th centuries, to ravage Italy and Germany. See Gibbon's *Decline and Fall of the Roman Empire*, De Guignes's *Histoire Générale des Huns* (1756). See, further, ARTILA.

**Hunt, Alfred William** (1830-96), English landscape painter, born in Liverpool. Ruskin's critical admiration of his *Llyn Idwal* in the Academy of 1856 determined his vocation. He painted mainly in water color, with fine observation of nature and delicately finished detail, and was a follower of Turner. Among his works may be named *Wastdale Head from Skyhead Pass* (1854), *Windsor Castle* (1889).

**Hunt, Helen**. See Jackson, Helen Fiske Hunt.

**Hunt, James Henry Leigh** (1784-1859), English essayist and poet, was born at Southgate, Middlesex and was educated at Christ's Hospital, London. In 1808, with his brother, he founded the *Examiner*, which he edited for thirteen years, and through whose columns Keats and Shelley were presented to the public. In 1812 an article on the prince regent led to Hunt's imprisonment for two years, but he continued during this period in the editorship of his paper, published his second volume of verse, *A Feast of the Poets* (1814), wrote *The Descent of Liberty a Mask* (1815), and began his most important poem, *The Story of Rimini* (1816). From 1819 to 1821 he conducted the *Indicator*, which contains his best work as an essayist and published other works. He visited Florence, returning to England in 1825 and in 1833 he began his residence at Chelsea, next door to Thomas Carlyle, with whom he soon became intimate. During his stay there his play, *A Legend of Florence*, was produced at Covent Garden Theatre, London, with a fair measure of success (1840). In 1850 appeared the most popular of all his books, the *Autobiography*. His other works include *Foliage* (1818), *Lord Byron and some of his Contemporaries* (1828), *The Religion of the Heart* (1853). Consult his *Poetical Works*, ed. by T. Hunt (1860), *Correspondence*, ed. by T. Hunt (1862), *Life* (with bibliography), by Monkhouse, L. Cross' (F. Carr) *Characteristics of Leigh Hunt*, Winchester's *A Group of English Essayists* (1910).

**Hunt, Richard Morris** (1828-95), Amer-

ican architect, was born in Brattleboro, Vermont. He designed the Lenox Library building in New York, the United States naval observatory at Washington, and the fine Administration Building for the World's Columbian Exposition at Chicago, the Yorktown monument, many fine villas at Newport and a type of business edifice in New York which became identified with his name. He was president of the Institute of Architects.

**Hunt, William Henry** (1790-1864), English artist of the English water color school. His subjects were mostly country scenes, as the interiors of barns and cottages, smithies, and fisher folk. *Too Hot*, *The Eavesdropper*, *Roses in a Jar*, are characteristic of his work. Consult Ruskin's *Notes on Samuel Prout and William Hunt*.

**Hunt, William Henry** (1824-84), American lawyer and political leader, was born in Charleston, S. C. In 1876, as the Republican candidate on the Packard ticket, he was defeated in a bitter contest for the position of attorney-general of Louisiana. He was a judge of the U. S. Court of Claims (1878-80), and was secretary of the navy from March, 1881, until April, 1882. From 1882 until his death at St. Petersburg he was the minister plenipotentiary of the United States to Russia.

**Hunt, William Holman** (1827-1910), English religious painter, born in London. He exhibited his first work in 1846. This was followed by scenes from Dickens and Scott, and by the more important *Flight of Madeline and Porphyro*, from Keats' *Eve of St. Agnes* (1848). At this period Hunt shared a studio with Rossetti, and the pair, along with Millais and a few other earnest young painters, inaugurated the 'Pre-Raphaelite Brotherhood'. Hunt's *Hireling Shepherd* was shown in 1853, and was followed by *Awakened Conscience* and his world-famed *Light of the World* (1854), to which may be traced much of later religious art in England and abroad. Thereafter followed *The Scapegoat* (1856), *Christ Discovered in the Temple* (1860), *The Triumph of the Innocents* (1885), *Isabella and the Pot of Basil*, and others. See PRE-RAPHAELITES. Consult Coleridge's *Holman Hunt*.

**Hunt, William Morris** (1824-79), American painter, was born at Brattleboro, Vt. He was one of the earliest discoverers of Millet, whose famous picture *The Sower* he purchased, and whom he visited at Barbizon. His most famous commission was the decoration of the ceiling in the Capitol at Albany, N. Y., with his two paintings *The Flight of Night*

and *The Discoverer*. Portraits of Chief Justice Shaw, Senator Evans, and Mr. Sumner, *The Prodigal Son*, *The Drummer Boy*, and *Charles River* are well known works.

**Hunter, David** (1802-86), American soldier, was born in Washington, D. C. He was conspicuous as the commander of the main column of McDowell's army in the first battle of Bull Run, was the successor of Fremont as Commander of the Western Department, then commanded in turn the Department of the South (issuing on May 9, 1862, a famous order immediately annulled by President Lincoln, freeing the slaves in this department), and the Department of West Virginia (1864-65). In 1865 he was president of the military commission which tried Mrs. Suratt, Atzerodt, and others charged with being implicated in the assassination of Lincoln.

**Hunter, John** (1728-93), Scottish anatomist and surgeon, brother of William Hunter, was born in Long Calderwood, Lanarkshire. He discovered the circulation in the human placenta (1780), the method of ligating the artery in cases of aneurism (1785), and the establishment of collateral circulation by anastomosing branches of arteries. He wrote on *Human Teeth* (1771), *Recovery of the Apparently Drowned* (1776), *Blood, Inflammation, and Gunshot Wounds* (1794). His museum in Leicester Square, London, was bought by the Government, and opened in 1813, when the Hunterian orations began. Consult Mather's *Two Great Scotsmen*.

**Hunter, Robert Mercer Taliaferro** (1809-87), American political leader, was born in Essex co., Va. He was a member of the Virginia bar. He was a representative in Congress (1837-43 and 1845-7), was speaker of that body (1839-41), and was a U. S. Senator from 1847 until 1861, when on the secession of his State he resigned and cast in his fortunes with the Confederacy. He was then secretary of state of the Confederate States (1861-2), was a Confederate senator (1862-5), and was one of the Confederate representatives at the Hampton Roads conference. After the war he was treasurer of Virginia (1874-80), and collector of the port of Tappahannock, Va. (1885-7).

**Hunter, William** (1718-83), Scottish anatomist and obstetrician, elder brother of John Hunter, was born in Long Calderwood, Lanarkshire. His collection of specimens now forms the Hunterian Museum at Glasgow University. His great work, *The Human Gravid Uterus*, appeared in 1774 (3d ed. 1843).

**Hunter, Sir William Wilson** (1840-

1900), British Indian historian and geographer, was born at Aberdeen. As director-general of statistics, he planned and carried out the first Indian census (1872). Under his superintendence were produced a *Statistical Survey of India* (128 vols.) condensed into 9 vols. for the *Imperial India Gazetteer* (1881, 2d ed. 10 vols., 1885-7), *Bengal and Assam* (22 vols. 1875-79), *Rulers of India Series* (1890-95). He also produced a *Dictionary of Non-Aryan Languages of India and High Asia* (1868), and *The Indian Empire* (1895).

**Hunter College**, originally known as the Normal College of New York City, was founded in February, 1870, and received a charter from the State in 1877. It is a part of the public school system of New York and tuition is free to the women residents of the boroughs of Greater New York. The chief purpose of the school is to encourage young women to enter the profession of teaching. In connection with the college the city maintains a high school, which serves for general education, college preparatory work and also as a model and practice school, a model elementary school including kindergarten, and a special training school for kindergarten teachers. Summer and evening sessions are held. For latest statistics see Table of American Colleges and Universities, under the heading UNIVERSITY.

**Hunting**, the pursuit of wild game for whatever purpose, but especially for sport. Hunting as a pastime is an ancient practice, depictions of wild beasts with hunters in pursuit are found on Assyrian and Egyptian sculptures. Hounds were in common use, while even lions were trained to follow game. The Greeks hunted big game on horseback or by trapping, and were particularly fond of hare hunting. In modern times stag hunting, fox hunting, otter hunting, the hunting of game birds, and the hunting of big game are all engaged in. In the present article only big game hunting will be discussed. For other phases of the subject see DEER STALKING, FOX HUNTING, SHOOTING, GAME LAWS, and articles on the various game birds, as GROUSE, PHEASANT, QUAIL, and others.

The term 'big game' may be said to include all wild mammals larger than the ordinary fox. The Himalayas and India, in Asia, are the greatest nursery and preserve of game in the world outside of Central Africa. The lion is now to be found only in certain arid hills on the Afghan frontier. The tiger, on the other hand, ravages everywhere that forest, swamp, or mountain will furnish him refuge.

Even more numerous and widespread is the leopard, or panther, and perhaps equally destructive are several other large and fierce cats. The brown bear abounds throughout southern Asia, and its pursuit is among the most dangerous of eastern sports. In the open grounds wolves, hyenas, and jackals range in packs, and are hunted with hounds as well as shot, while various wild dogs are the terror of the jungle. Here, too, is followed the exciting chase on horseback of the wild boar, the spearing of which, or 'pig-sticking,' is considered excellent sport.

The elephant ranges over the higher parts of Central India, Burma, Siam, and in Ceylon, but it is well protected by law. Rhinoceroses of three species may be had in swampy forest-tracts from the Ganges delta southward to Cochin China and Borneo. In the same stretch of tropical jungles wild oxen are to be hunted. The sportsman's powers of climbing and skill in striking may be tested by the wild yaks or any of a dozen varieties of sheep, ibexes, and goat-antelopes, inhabiting the heights of the Central Asian plateau and mountain systems. Africa has long been known as preeminently the home of strange and wonderful forms of life, and in certain districts big game survives in large numbers. Most characteristic of these are the elephant, lion, leopard, hippopotamus, giraffe, antelope, gorilla, rhinoceros, buffalo and zebra.

The fate of big game in America has been similar to that of other regions. The bison, which two centuries ago came east to the Alleghenies, is now represented by only a few protected bands kept as curiosities. The wapiti or elk, once equally wide-ranging, is now to be seen only in the northern Rocky Mountains. Moose and woodland caribou may still be shot, when local laws permit it, in Eastern Canada, Maine, Northwestern Canada, and parts of Alaska. The more reindeer-like Barren Grounds caribou still migrate annually in countless herds between the Arctic coast and the northern border of the forest-lands, but, like the musk-oxen of that region, are beyond the reach of most sportsmen. A similar inaccessibility has preserved thus far the white goat-antelope. The big-horned wild sheep were once common throughout the whole mountainous west, but are now rare south of the Canadian boundary. Two other beautiful game animals of the West have been nearly destroyed—the mule-deer and the prong-horn—both of which are now few and scattered. The small, common, white-tailed deer remains scattered over nearly every State in the Union. The for-

ests and mountains of the Eastern States and Canada still shelter a fair number of black bears. The puma long ago disappeared from the eastern half of the country, but the northern lynx and southern and western bobcat still dwell in the wilder parts of the East, and are trapped or poisoned. Pumas are to be found in the Rocky Mountains, and on the Pacific slope, where they ravage the livestock of ranches, and, with the two bears—the grizzly and the black—furnish good sport.

Sport is not to be had, or big game of consequence obtained in South America, until the pampas of Argentina are reached, and there guanacos and ostriches (rheas) are about all that properly come under the head of 'big game,' except the puma and jaguar—the latter not known south of Paraguay. Among the best known hunters who have made expeditions in search of big game both for the sake of sport and in the interest of science are Carl Akeley, who has made three trips to Africa and brought back valuable specimens and written instructive articles on his experiences, Paul Ruess, who has hunted big game in the Rockies, in the Arctic regions, and in British East Africa, and has photographed many wild animals in their native haunts, and Theodore Roosevelt, who in 1909 was sent by the Smithsonian Institution of Washington on an expedition to British East Africa to obtain specimens of wild animals in that region. Remarkable moving picture films have been made in recent times by Martin Johnson and other explorers of African animals never before pictured in their native haunts.

Consult S. W. Baker's *Wild Beasts and Their Ways*, H. G. Hutchinson's *Big Game Shooting*, Karl Hagenbeck's *Beasts and Men*, Theodore Roosevelt's *A Wilderness Hunter*, *American Big Game*, *African Game Trails* (1910), and *A Booklover's Holiday in the Open* (1916), F. G. Aillalo's *A Book of the Wilderness and Jungle* (1912), W. S. Rainford's *The Land of the Lion* (1913), G. B. Grinnell's *Hunting at High Altitudes* (1913), C. Kearson's *Wild Life Across the World* (1913), Sydney A. Christopher's *Big Game Shooting in Lower Burma* (1916), Robinson's *Woodland, Field and Waterfowl Hunting* (1946).

**Hunting Dog**, a wild canine (*Lyaon pictus*) distributed over most of Africa. It resembles a hyena in form, but is more slender, and is irregularly blotched with black and tawny. Its native prey was principally antelopes and zebras, but the flocks and herds of farmers now suffer greatly from their depredations.

**Huntingdon**, municipal borough, capital of Huntingdonshire, England, is situated on the Ouse, 18 m s of Peterborough. It is the birthplace of Oliver Cromwell, and at the grammar school, founded in 1260, Oliver Cromwell was educated. Cromwell House occupies the site of the house in which the Protector was born. P. 4,194.

**Huntingdon**, borough, Pennsylvania, co seat of Huntingdon co. It is the seat of Juniata College. It was settled about 1760. A 'Standing Stone Monument' marks the old Indian council ground which occupied the site of Huntingdon, p. 7,170.

**Huntingdonshire**, or **Hunts**, an inland county of England. The south and west are undulating, with low hills, the east belongs to the Fen district. The chief rivers are the Ouse in the south and the Nene in the north. Agriculture and pasturing are leading industries. Area 366 sq. m., p. 56,204.

**Huntington**, town, New York, Suffolk co (Long Island). A State fish hatchery is located here. A monument marks the spot where Nathan Hale was taken by the British, p. 25,582.

**Huntington**, Archer Milton (1870- ), American author, adopted son of Collis P. Huntington, was born in New York and was educated privately there and in Spain. He carried out archeological investigations for the Spanish government, founded the Hispanic Society of America, and did much to encourage interest in Hispanic matters. He edited *Lady Isidoro's Travels into Spain* (1899), *The Poem of the Cid*, with translation and notes (1897), and other Spanish texts, and wrote *A Note Book in Northern Spain* (1898) and *A Flight of Birds* (1938).

**Huntington**, Collis Potter (1821-1900), American railroad builder, was born in Haverhill, Conn. He was one of the builders of the Southern Pacific and the Chesapeake and Ohio, and gradually acquired a large number of other railroad lines as well as great steamship interests. He accumulated a large fortune, and by liberal gifts encouraged negro and Indian education and other educational enterprises. His valuable collection of paintings he bequeathed to the Metropolitan Museum of Art.

**Huntington**, Daniel (1816-1906), American painter, a member of the 'Hudson River group,' was born in New York. He devoted himself, as far as more lucrative portrait painting would permit, to historical and genre work, his interpretations of *The Pilgrim's Progress* and of scenes from Irving's *Sketch Book* being



especially noteworthy. He visited England in 1851, and there painted several portraits, notably those of Sir Charles Eastlake and the Earl of Carlisle (collection New York Historical Society). He was president of the National Academy in 1862 and 1869, and again in 1877-91. His work includes portraits of Lincoln, Agassiz, W. C. Bryant, and others.

**Huntington, Ellsworth** (1876-1947), American geographer, was born in Galesburg, Ill. He spent several years in Turkestan, Russia, Siberia and Persia and after serving at Yale as instructor, and assistant professor of geography, in 1917 he became research associate. He has been research associate in Carnegie Institute, Washington, and has made many investigations in relation to climate and geologic changes. His published works include *The Pulse of Asia* (1907), *The Human Habitat* (1927), *Geography in Human Affairs* (1946).

**Huntington, Frederic Dan** (1810-1904), American Protestant Episcopal bishop, was born in Hadley, Mass. He was professor and preacher in Harvard in 1855-60, lecturer in the Episcopal Theological Seminary, Cambridge, Mass., and the General Theological Seminary, New York City, and rector of Emmanuel Church, Boston (1861-69). In 1869 he was consecrated bishop of the newly created diocese of Central New York. He edited *The Christian Register* and *The Monthly Religious Magazine*, and *The Golden Rule Applied to Business and Social Life* (1892).

**Huntington, Samuel** (1731-96), American jurist and revolutionary leader, a signer of the Declaration of Independence, was born in Windham, Conn. He was a member of the Continental Congress (1776-84), and was president of that body in 1779-81, was a judge of the superior court of Connecticut in 1786-96.

**Huntington, William Reed** (1838-1909), American Protestant Episcopal clergyman, was born in Lowell, Mass., and was rector of All Saints Church, Worcester, Mass., from 1862 to 1883, when he became rector of Grace Church, New York City. He published *The Church Idea* (1870), *Short History of the Book of Common Prayer* (1893), *A Good Shepherd and Other Sermons* (1906), etc.

**Hunts**. See **Huntingdonshire**.

**Hunyadi, Janos, or John Corvinus Hunyady** (?1395-1456), national soldier-hero of Hungary, was probably born in Hunyad in Transylvania. He became prominent first in 1437, when he appeared on the battlefield and caused the defeat of the Turkish Sultan at Semendria. His last and most famous achieve-

ment was the relief of Belgrade (1456), in which he was assisted by the monk Crispinano Hunyadi. Hunyadi has been looked upon as the saviour of Christianity, for it was largely due to his efforts that the Turks failed to gain an entrance to Central Europe.

**Huon of Bordeaux**, a romantic narrative poem of the 13th century, belonging to the Charlemagne cycle, one of the *chansons de geste*. From it Shakespeare drew some of the dramatic personae of *A Midsummer Night's Dream*, and Weber and Weeland the plots of *Oberon*.

**Hupa**, an Indian tribe in Northwestern California noted for their skill in basketry of the twine-woven type.

**Hupeh**, province of China, lies in the centre of the country, and has an area of about 71,000 sq. m. It is generally hilly in the north, but low in the central and southern parts. The Yangtze and Han rivers intersect it, and there are numerous lakes and canals. Iron and coal are found, the Taichang iron mines being the largest in China. Wuchang-fu is the capital. There are three treaty ports, Hankow, Ichang and Sha-shih, p. 34,000,000.

**Hurd, Richard** (1720-1808), English ecclesiastic and writer, was born in Congreve, Staffordshire. He became successively bishop of Lichfield and Coventry (1774), and of Worcester (1781). His first notable production appeared anonymously in 1749, *Commentary on Horace's Ars Poetica*. Other works are *Dissertations on Poetry* (1757), *Uses of Foreign Travel* (1764).

**Hurdy-gurdy**, a musical instrument from which the sound is obtained by the friction of strings of catgut or wire, stretched on a sounding board, the various notes being stopped by a simple apparatus of keys. In appearance it resembles the guitar and the lute. The vibration of the strings is produced by a wooden wheel, which is turned by a handle at the end. The name is popularly applied to itinerant street pianos.

**Hurley, Edward Nash** (1864-1933), American public official, was born in Galesburg, Ill. He was the founder of the pneumatic tool industry and was actively engaged in its promotion. During the Great War he was chairman of the U. S. Shipping Board and president of the Emergency Fleet Corporation (1917-19). He was a member of the World Debt Commission and has received many other distinguished honors and has many important business connections. He is the author of *The Awakening of Business* (1918), *The Bridge to France* (1927), etc.

**Hurley, Patrick Jay** (1883- ), American public official, was born in Indian Territory. He was attorney for the Choctaw Nation (1912-17), served overseas in the Great War reaching the grade of lieutenant-colonel, and was cited for gallantry in action. As attorney for the United States Army of Occupation in Germany he negotiated an agreement with the Duchy of Luxemburg, and he has held many important civil offices. He was Secretary of War in President Hoover's cabinet (1929-33), brigadier general in 1942, represented the President in various countries (1943), ambassador to China (1944-45).

**Huron**, one of the Great Lakes of North America, traversed north and south by the boundary line between the United States and Canada. It is connected with Lake Superior northwestward by St. Mary River and with Lake Erie on the south by the rivers St. Clair and Detroit. The Strait of Mackinaw connects it with Lake Michigan. It is second in size of the Great Lakes, with a water surface of 23,010 sq. m. (9,110 U. S., 13,900 Canada), and a drainage basin of 72,600 sq. m. The mean level of its surface above the sea is 581.13 feet. The water of Lake Huron is cold and pure, and abounds in fish, the white fish being the most important. Huron is subject to violent storms. The largest group of islands in the lake is that of Grand Manitoulin belonging to Canada. See GREAT LAKES.

**Huron College**, a coeducational institution in Huron, South Dakota, founded in 1883 as Pierre University, and moved from Pierre to Huron in 1898, when its present name was adopted. It is a well-organized and thoroughly accredited institution conducted under Presbyterian management. For recent statistics see Table under the heading UNIVERSITIES.

**Huronian**, a name given by Sir William Logan to a group of rocks, mostly of metamorphic character, which underlie the oldest fossiliferous strata of the North American continent, and are largely developed in the vicinity of Lake Huron. Valuable masses of iron ore are found in this group.

**Hurons**, a confederacy of North American Indians, whose name has been given to the great lake, the northern shores of which were formerly occupied by them. They removed to Sandusky Bay, and then to Indiana and Illinois for a time, but returned to Detroit and Sandusky where they became known as Wyandots. In 1842 they again removed to Kansas and in 1867 to Northeastern Oklahoma.

**Hurricane**, the name applied to tropical cyclones which occur between 30° N. lat. and

30° S. They do not embrace so large an area as cyclones in higher latitudes, but are characterized by much lower barometric pressures and exceedingly violent winds, which sometimes attain a velocity of 100 m. or more an hour. In the centre of the disturbance there is a calm, but immediately surrounding this is an area of very heavy winds, while on the outside borders the wind is light. In the China Sea severe hurricanes, known as typhoons, are frequent. See STORM.

**Hurst, Fannie** (1889- ), author, was born in Hamilton, O. She engaged in sociological research work in New York City, and traveled in Russia, following which she wrote and lectured. She has been deeply interested in civic and intellectual movements affecting women. Among her short stories are *Humoresque*, *Song of Life*, among her novels are *A President Is Born*, *Five and Ten*, *Back Street*.

**Hurtado de Mendoza, Diego** (1503-75), Spanish statesman and man of letters, was born in Granada. His *redondillas*, in the old Spanish style, are full of sparkling wit, but his best work, however, is the prose, *Guerra de Granada* (1627), a model of classical Castilian and historical form.

**Husband and Wife**, a man and woman united by a lawful marriage. Though based on contract, the relation of husband and wife involves mutual rights and obligations which pass beyond the sphere of contract and are annexed by law to the *status* created by the marriage, and its legal consequences extend even beyond those mutual relations, determining the legitimacy of children, and giving rise to relations of consanguinity and affinity. The relation is permanent, and is terminated only by death or divorce.

In the United States the laws governing marital relations differ in different States but in general it may be said that husband and wife are entitled to one another's society and that any disturbance of this right is an actionable wrong. If either refuses to live with the other the injured one is entitled at common law to maintain in action against the other for the restitution of conjugal rights. As against others infringing conjugal rights, either husband or wife has in action for the alienation of the other's affections.

The wife's domicile is that of her husband and changes with it. The husband has a right to the control and custody of his wife, but as far as this implies physical restraint, the right is of a very limited nature. A husband is liable to support his wife and family. If he does not do so, the wife may pledge his credit for nec-

essaries while she lives with him, or if she lives apart owing to his misconduct

The property relations of husband and wife at common law based on the notion that the identity of the wife was merged in that of the husband, have in the last half century been completely transformed, both in England and the United States, and a married woman is now generally entitled to hold as her separate property, and to dispose of, all real and personal property belonging to her at the time of the marriage, or which shall devolve on or be acquired by her thereafter. In England and generally in the United States, the rights of husband and wife, as survivor to the real and personal property of the other, remain substantially as at common law.

**Hu Shih** (1891- ), Chinese philosopher, educated at Cornell, ambassador to U S (1938-42), simplified written Chinese

priestly office within the diocese. But Huss became the champion and hero of the nationalistic sentiment, and Archbishop Šebek finally excommunicated him in 1410. In his retirement Huss wrote his principal book, *De Ecclesia*. In 1414 a great Ecumenical council of the church met at Constance, and the reformer, summoned to attend the council, travelled to Constance under the security of a free imperial pass. Nevertheless, three weeks after his arrival, he was seized and imprisoned, and upon his refusal to recant doctrines or to submit himself unconditionally to the authority of the council, he was condemned to the stake, and forthwith (July 6, 1415) led out and burned, dying as steadfastly and as bravely as he had lived and preached. Consult Writslaw's *John Huss*.

**Hussars**, light cavalry soldiers. They were originally a distinct type of Hungarian mount-



*A Hurricane Scene*

**Husi**, or **Hushi**, town, Rumania, in Moldavia. Here in 1711 the peace of the Pruth was signed between the Russians and Turks, p 18,500

**Huss, Henry Holden** (1862- ), American musician, was born in Newark, N J. He was graduated (1885) from the Munich Royal Conservatory and continued his musical career in New York, where he gave instruction on the piano, played himself, and composed a number of pieces for vocal and instrumental interpretation.

**Huss, or Hus, John** (?1369-1415), Bohemian reformer, known originally as Hussinecz, from the village at the foot of the Bohmerwald in Bohemia where he was born. At the University of Prague he became imbued with the spirit of Wycliffe, and in 1402 he was appointed rector of the university. Six years later he was forbidden by Šebek, archbishop of Prague, to preach or perform any

ed troops, raised by Matthias Corvinus in 1458 to operate against the Turks.

**Hussites**, War of the. The Hussite movement, which became prominent in the early years of the 15th century, was partly secular, partly religious. It was both an attempt on the part of the Slavs who inhabited Bohemia to check the Teutonic advance eastward and a protest against the corruption of the papacy. The death of Huss at the hands of the Council of Constance provoked violent indignation among the Bohemian reformers, and a revolt against the churches and monasteries swept over Bohemia. In 1420 Pope Martin V proclaimed a crusade against the Hussites, but the German armies were defeated and the Hussites were again victorious in 1427 when another crusade was launched against them. In 1434 civil war broke out, the Taborites as the extremists in Bohemia were called, were defeated at Lipau, and a compromise was

made with Sigismund, who entered Prague in August, 1436

**Huston, Walter** (1884- ), Canadian stage and screen actor After successes in vaudeville and on the legitimate stage, he went to Hollywood in 1928 and a score or more productions followed He returned to the legitimate stage in Sinclair Lewis's *Dodsworth*, and in Hollywood made a picture of the same play In 1937 Mr Huston toured with his own company in a production of *Othello* He returned to Hollywood and in 1943 played the part of Joseph E Davies in the motion picture *Mission to Moscow*

**Hutcheson, Francis** (1694-1746), Irish philosopher, was born probably in Drumragh, co Down, Ireland He settled in Dublin as head of a private school, and in 1725 published *An Inquiry into the Original of Our Ideas of Beauty and Virtue*, which brought him into prominence This was followed in 1728 by an *Essay on the Nature and Conduct of the Passions and Affections and Illustrations upon the Moral Sense* From 1729 till his death he was professor of moral philosophy at Glasgow, and published many works including *De Naturali Hominum Socialitate* (1730), *Philosophia Moralis* and *Metaphysicæ Synopsis* (1742), *System of Moral Philosophy* with Memoir by Dr Leechman (2 vols 1755), *Logic* (1764) Hutcheson was, the pioneer of the 'Scottish school' of philosophy, and a precursor of the utilitarians

**Hutchins, Harry Burns** (1847-1930), American educator, was born in Lisbon, N H He was professor of law in Cornell University from 1887 to 1894, when he returned to the University of Michigan, first as professor and dean of the department of law, then acting president and president (1910-20)

**Hutchins, Robert Maynard** (1899- ), American educator, was born in Brooklyn, N Y He was graduated from Yale in 1921 and after teaching a short time, served as secretary at Yale (1923-7), and as dean of the Law School (1927-9) In 1929 he was chosen president of the University of Chicago

**Hutchins, Thomas** (1730-89), American geographer, was born in Monmouth co, N J In the latter part of the Revolutionary War he was appointed geographer-general by General Greene He is best known as the author of a *Historical, Narrative, and Topographical Description of Louisiana and West Florida* (1784), which furnishes valuable material concerning the last years of the Spanish regime in Louisiana and the territory w of the Rio Perdido

**Hutchinson, Anne (Marbury)** (c 1590-1643), a religious enthusiast, was born in Lincolnshire, Eng She emigrated with her husband, William Hutchinson, to the Massachusetts Bay Colony, in 1634, and soon began to hold religious meetings, and in general assumed an attitude of revolt against the rigid legalism of the Puritan church system

Mrs Hutchinson was eventually tried by the Boston church, excommunicated, and driven from the community (1638) She and her adherents then settled in Rhode Island After the death of her husband she removed to a place near Stamford, Conn, within the jurisdiction of the Dutch of New Netherlands, and in 1643 she and her large family (one excepted) were massacred by the Indians

**Hutchinson, Thomas** (1711-80), the first royal (civil) governor of Massachusetts, was born in Boston Mass He was chief justice of the Superior Court of Massachusetts (1761-9), was lieutenant-governor of the province (1758-71), and was acting governor in 1769-71 From 1771 until 1774 he was the last civil governor of Massachusetts Thereafter, having removed to London, Eng, he was frequently consulted by the British government with regard to American affairs advocating on the whole a conciliatory policy He wrote an excellent *History of Massachusetts Bay* (3 vols 1764-1828)

**Hutia (Capromys)**, or Hog Rat, a name applied in combination to certain large rodents of the West Indies

**Hutter, Ulrich von** (1488-1523), German scholar, was born in the castle of Steckelberg, near Fulda In 1517 he settled in Germany, devoting his time and energy to free that country from the dominance of Roman Catholicism For his poetical achievements, that same year, the Emperor Maximilian crowned him poet laureate At length his outspoken criticism of the Roman Catholic hierarchy led to Hutter's extradition, he found a shelter, and he soon became as noteworthy a champion of the Reformation as he had been a zealous humanist Of his works, the best known are the *Dialogues*, some of which he translated into German (1521) His complete works were published by Boeking (1859-70)

**Hutton, Frederick Remsen** (1853-1918), American mechanical engineer, was born in New York City He was assistant professor of engineering at Columbia from 1877 to 1891, professor from 1891 to 1897, and dean of the Columbia faculty of engineering from 1899 to 1905 He served as consulting engineer in the

New York City department of water, gas and electricity in 1911-12 and did important editorial work in connection with Johnson's *Encyclopedia* and the *Century Dictionary*. He is the author of *Water and Heat Engines* (1890), *The Gas Engine* (1904), etc.

**Hutton, Laurence** (1843-1904), American author, of Scottish ancestry, was born in New York City, where he attended school. He was literary editor of *Harper's Magazine* from 1886 to 1898, in the latter year removing from New York to Princeton where he became university lecturer on English literature. He was a founder of the New York Authors and Players Club and a member of the National Institute of Arts and Letters. His published works include the books on dramatic subjects *Plays and Players* (1875), *American Actor Series* (1881-2), *Curiosities of the American Stage* (1887), *Memoirs of Edwin Booth* (1893), and a delightful series of literary guidebooks.

**Huxley, Aldous** (1894- ), British novelist, author of *Brave New World* (1932), *Eyeless in Gaza* (1936), *Ends and Means* (1937), *After Many a Summer Dies the Swan* (1939), *Gray Linnence* (1941), *The Perennial Journey* (1945).

**Huxley, Julian Sorrell** (1877- ), English scientist and author, grandson of T. H. Huxley. He wrote popular works on science, including *Essays of a Biologist* and *Religion without Revelation*. Was director general of United Nations UNESCO (1946- ).

**Huxley, Thomas Henry** (1825-95), English man of science, an earnest advocate of the doctrine of evolution, was born in Ealing, Middlesex. He studied medicine and in 1846 was appointed assistant-surgeon to H.M.S. *Rattlesnake*, then about to proceed on an exploring expedition to the coast of New Guinea and the Barrier Reef of Australia. During the voyage (1848) he wrote his paper 'On the Anatomy and Affinities of the Family of the Medusæ,' which contains extremely important scientific data. In 1854, after having endured a struggle against adversity, he succeeded Professor Forbes at the Government School of Mines in Jermyn Street, London, a position in which he passed most of his life, though he also held many other posts of honor. In 1876 he went to America where he lectured on evolution and other biological subjects.

Huxley's *Scientific Memoirs* were republished in four volumes by Sir Michael Foster and Professor Ray Lankester (1898, suppl. vol. 1903), and his collected essays, some of

them theological and containing his brief but charming autobiography, were republished in nine volumes in 1893-4. It is by many of these essays and controversial papers that Huxley is best known popularly. Of his textbooks, many, such as *Lessons in Elementary Physiology*, *Physiography*, *Anatomy of Vertebrated and Invertebrated Animals*, are models of clarity and accuracy. Consult his *Life and Letters*, by his son Leonard Huxley, Osborn's *Huxley and Education*.

**Huy, fortified town**, Belgium, in the province of Liège. It has a citadel hewn from solid rock and an interesting mediæval church. The abbey of Neufmoustier in the suburbs was founded by Peter the Hermit, who is buried in it. The town was occupied by the Germans at the beginning of the Great War, p. 15,000.

**Huygens, Christian** (1629-95), Dutch physicist and horologist, son of Constantijn Huygens, was born in The Hague. After devoting himself to the study of mathematics, he turned his attention to the improvement of telescopes, and discovered an improved method of grinding and polishing lenses. With his new instrument he was able to define Saturn's ring (1655), and about the same time he applied the pendulum to regulate the movements of clocks, and presented the first pendulum clock to the States-general (1657). He also developed Galileo's doctrine of accelerated motion under the action of gravity, preparing the way for Newton. He defined the wave theory of light, which had been suggested by earlier investigators and discovered the phenomenon of polarization. His chief works are *Theoremata de Quadratura Hyperbolis, Ellipsis, et Circuli* (1651), *Horologium Oscillatorium* (1657), *Systema Saturnium* (1659). *His Œuvres Complètes* were issued by the Amsterdam Academy of Sciences (1888-95).

**Huygens, Constantijn** (1596-1687), Dutch poet, was born in The Hague. He was one of the most original poets of Holland and published *Bataja Tempe*, an account in verse of local legends, *Costelick Mal*, satiric verse, *Olia, Ledge wren*, and *Korenbloemen*, a collection of poems.

**Huysum, Jan van** (1682-1749), Dutch painter, was born in Amsterdam. He studied under his father and first devoted his attention to landscape painting, later turning to fruit and flowers, of which he became one of the greatest painters.

**Hven**, island, Sweden, at the southern end of The Sound. It was here that the astron-

omer T'ge (T'cho) Brah built the observatory of Uraniborg

**Hwang Ho** See **Yellow River**

**Hwangpoo**, river, China, in the province of Kiang-su, which it drains in the southeast. It joins the Yangtze at Wusung, 12 miles below Shanghai, where a bar necessitates the lightening of vessels of deep draught.

**Hwen - thsang**, or **Hsien - T'sang** (765-664), Chinese monk and traveller, was born near Honan. He was ordained to the priesthood in 622 and in 629 made a pilgrimage to India to visit the sacred places. His memoirs gave a faithful and valuable account of religious India at that time (631-644). An abstract of the translations appeared in the 17th volume of the *Journal of the Royal Asiatic Society*.

**Hyacinth**, also known as **Jacinth**, a rock which includes the yellow, orange, red, and brown zircons. See **ZIRCON**, **VESUVIANITE**.

**Hyacinth**, a genus of bulbous plants belonging to the order Liliaceae. They are popular, hardy, spring-flowering bulbs, with radical leaves and fragrant blossoms, pink, blue, purple or white, arranged in racemes. There are some 30 species. Hyacinths of all kinds are extensively cultivated near Harlem, in Holland. The water hyacinth is a member of the Pontederiac family (*P. crassipes*), naturalized in the streams and ponds of the southern United States.

**Hyacinthus**, in Greek legend, was the son of the Spartan king Amyclas, and famous for his beauty. He was passionately loved by Apollo, who while engaging in a game of quoits with him accidentally struck and killed him. From his blood there sprang the hyacinth flower.

**Hyades**, *ι c*, the 'Rainers'—the name given by the ancient Greeks to seven stars in the head of the constellation Taurus, whose rising simultaneously with the sun was held to portend wet weather.

**Hyaenas**, usually spelled **Hyenas**, are of the family Hyænidæ, are carnivores, related to the civets. They are confined to the Old World and are not now found in Europe. They are ugly animals, with long front legs, short and broad heads, coarse, shaggy fur, and short tails. There are three living species: the striped hyena (*H. striata*), which extends from India to North Africa, the brown hyena (*H. brunnea*) of South Africa, and the large spotted hyena (*H. crocuta*) of Africa generally.

**Hyaenodon**, a genus of fossil carnivorous

animals, belonging to the creodonts, about the size of a leopard.

**Hyatt, Alpheus** (1838-1902), American naturalist, was born in Washington, D. C. He was associated with the Boston Society of Natural History as custodian in 1870, and curator in 1881. That same year he was appointed professor of zoology and paleontology in the Massachusetts Institute of Technology and at Boston University. He did original and valuable investigating work on American sponges and the fossil Cephalopoda and edited various textbooks.

**Hyatt, Anna Vaughn** (now Mrs **Arch-er Huntington**) (1876- ), American sculptor, was born in Cambridge, Mass. She was educated in private schools and later was a pupil of Gutzon Borglum. Among her works are statues of Joan d'Arc in the Cathedral of St. John the Divine and elsewhere in New York City and many small bronzes of animals.

**Hyatt, John Wesley** (1837-1920), American inventor, was born in Starkley, N. Y. He discovered a process for dissolving paraffin under pressure, thereby making possible the economical manufacture of celluloid, invented 'bonolite' (1878), used in making billiard balls, and devised a water purifying system (1881), a lock-stitch sewing machine for sewing belting (1900), a machine for squeezing the juice from sugar-cane, and a method of solidifying hard woods.

**Hybla**, the name of three ancient towns in Sicily. One, known as *Hybla Geleatis*, was situated on the southern slope of Mt. Etna, where Paterno now stands. *Hybla minor*, afterwards known as Megara, was about 40 m. from Augusta, and *Hybla Heraclea* was on the road from Syracuse to Agrigento. One of these towns—it is uncertain which—was famous for the production of the Hyblaean honey, celebrated in poetry.

**Hybrid**, the offspring of the union of two distinct species, as the mule, the result of a cross between ass and mare. Naturalists believed formerly that all hybrids were necessarily sterile. Fertile hybrids are not common among animals, but Darwin himself reared healthy young from a pair of hybrids between the domestic goose (*Anser ferus*) and the Chinese goose (*A. cygnoides*), which are distinct species. Among plants not a few florists' flowers are hybrids, and are yet perfectly fertile. On the whole, therefore, while hybrids among animals especially are usually more or less sterile, they are not invariably

so, and among plants fertile hybrids are not uncommon. Consult Ewart's *Guide to the Zebra Hybrids* (1900), and Mendel's *Experiments in Plant Hybridization* (1925). For the theoretical bearing of the occurrence of hybrids on the theory of evolution, consult the works of Darwin and Wallace, especially *The Origin of Species* (1859) and *Darwinism* (1890), and Morgan's *Evolution and Adaptation*.

**Hydatid Cyst** See Tapeworms

**Hyde, Arthur M.** (1877- ), American public official, was born in Princeton, Mo. He was mayor of Princeton 1908-10, and moving to Trenton, Mo., in 1915, he was Governor of Missouri, 1921-5, during which

(1897), *A Literary History of Ireland* (1899)

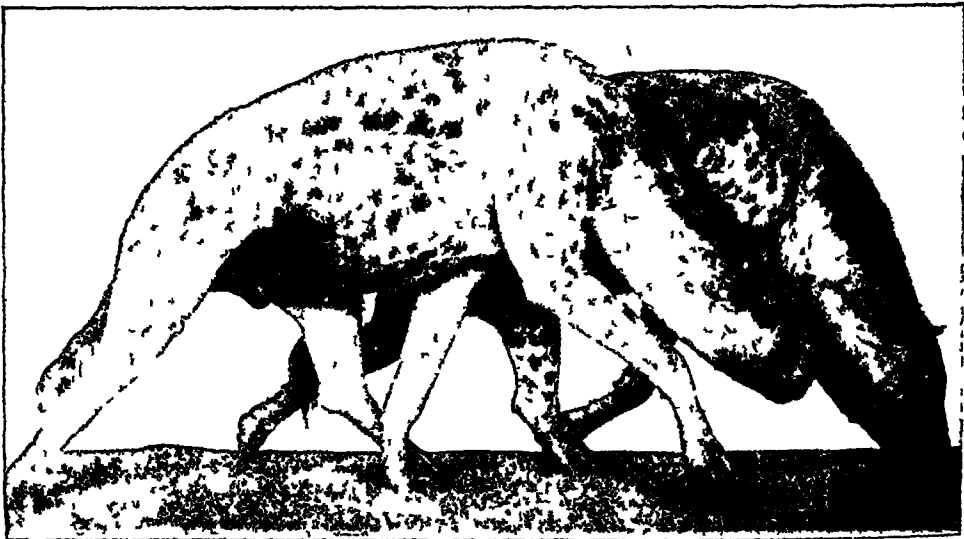
**Hyde, Edward** See Clarendon

**Hyde, Edward**, 3d Earl of Clarendon

**Hyde Park** See London

**Hydnum**, a genus of fungi, terrestrial and parasitic, characterized by the hymenium, or fructifying surface, being spread overawl-shaped prickles or tubercles, which are distinct at the base and project downward like spines, or the teeth of a comb. They have fleshy bodies, which in several species are edible, and in none poisonous. It is found in woods and open places and when raw has a sweet, slightly pungent taste.

**Hydra**, a fabulous hundred-headed mon-



American Museum of Natural History, N. Y.

Spotted Hyaena of Ethiopia

time he made a strong fight for fire prevention. In 1929-33 he was Secretary of Agriculture in President Hoover's cabinet.

**Hyde, Douglas** (1860- ), Irish folklorist and poet, was born in Frencpark, County Roscommon. He became president of the Gaelic League in 1893, and was president of other societies connected with the new Irish literary movement, visiting the United States in 1906 in the interest of the movement. In 1909 he became professor of modern Irish in University College, Dublin, and in 1925 he became editor of *Lia Fáil*. Elected President of Éire, 1938. In addition to his work on the ancient Irish language, he published *Beside the Fire* (1890), *Love Songs of Connacht* (1894), *Story of Early Irish Literature*

(1897), *A Literary History of Ireland* (1899). As soon as one herd was cut off two sprang up in its place, until Hercules seared the stumps with fire. The mouths were charged with a deadly poison, in which Hercules dipped his arrows.

**Hydra**, an ancient southern constellation extending through many hours of right ascension, from the south of Cancer to the west of Scorpio.

**Hydra**, a small fresh-water polyp found attached to weeds in ponds. It is a very simple coelenterate, with a slender body, consisting of a hollow cylinder, which reaches a length of from  $\frac{1}{4}$  to  $\frac{1}{2}$  inch. The terminal mouth is surrounded by tentacles armed with stinging cells, by means of which the hydra

obtain the minute organisms on which it feed. Two species, a green and a brown one (*H. viridis* and *H. fusca*), are common in American ponds and other still fresh waters.

Hydragogues, in medicine the name given to the more active purgatives, which cause water evacuation. See **APRIFRANTS**.

Hydrangea, a genus of deciduous shrubs belonging to the order Saxifragales. They have large corymbose heads, of small flowers, white, pink or blue, with enlarged, showy, marginal, sterile flowers. In some cases the whole head is composed of these sterile flowers.

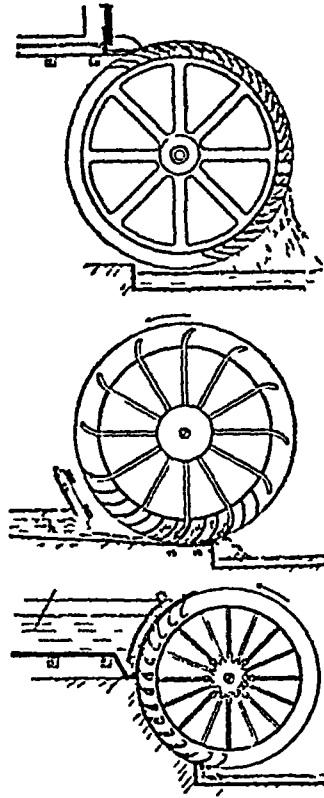
Hydrate, a term formerly applied to any compound formed by the combination of water with other substances, but now reserved for compounds containing water molecules that have undergone no rearrangement.

Hydraulic Giant or Monitor, the popular name for an apparatus widely used in mining. The whole machine is extremely simple, consisting of an elbow connected with a high-pressure pipe line, a universal joint and a long nozzle, like a fire nozzle, with a counter-weight. The force of the jet from this nozzle may, with the necessary head, be so powerful that even the hardest earth will be washed away by the water.

Hydraulic Machinery. Hydraulic machinery may be classified as follows: (1) Machines built to transform, more or less continuously, energy of moving water into mechanical energy. Among these will be mentioned the different kinds of water wheels, turbines, and hydraulic engines and motors. (2) Machines in which water or other liquids, such as oil, act as a medium for the transmission of power. Included in this category are pipe lines, hydraulic rams, grunts, and pistons, which have many applications in presses, jacks, turbine governors, accumulators, elevators, etc.

**Waterwheels and Turbines**—The tremendous extension in the use of electric power, with its flexibility of operation and its ease of transmission, has made obsolete many of the older styles of waterwheels and stimulated development of the special types suitable for driving electric generators. At present waterwheels are used almost exclusively for this purpose, except in special cases, such as for direct connection to wood pulp grinding machines, for pumping under certain conditions, etc. In general, electric generators of a high speed of rotation are more economical than low speed generators, and direct connection of the waterwheel to the generator on the

same shaft affords more reliable operation than a belted or geared connection. Consequently, waterwheel development during the past twenty-five years has taken place principally along the line of increasing the speed of rotation of the waterwheel under given heads. Among practically obsolete types, interesting solely from the historical point of view, are the under-shot wheel, breast wheel and the over-shot wheel.



Old Types of Waterwheel  
Upper, Over-shot, Middle, Under-shot, Lower, Breast Wheel

The reaction turbine differs from the older wheels in that water by its pressure or by its velocity head acts simultaneously on all the vanes of the wheel. In the mixed flow reaction turbine, which has been most generally used during the past twenty-five years, the water enters the wheel at the outer edge of the vanes and follows the vane toward the center of the wheel, at the same time the streamlines turn until they are approximately parallel with the shaft which may be either hori-



horizontal or vertical. In recent practice emphasis has been placed upon turbine efficiency in order to obtain the maximum possible power available from the water available, and by careful study and experiment on the part of manufacturers, efficiency curves of excellent operating characteristics have been developed. The 1907 turbine at the time it was installed was considered to have a remarkably wide operating range at high efficiency. The 1912 turbine was substantially better, and the 1921 turbine shows practically 90 per cent efficiency for loads varying from 50 per cent to 100 per cent of capacity.

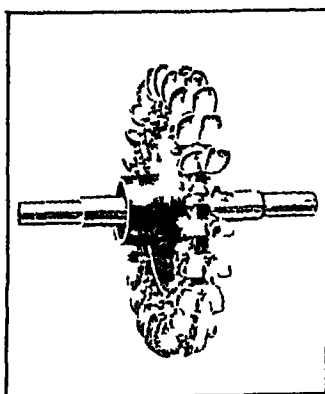
Draft tube designs play an important part in the turbine setting, particularly in low head developments. An improperly designed draft tube will substantially narrow the range of smooth operation and will reduce the efficiency of the unit. The early practice was to use a vertical conical tube to discharge the water as directly under the runner as feasible, although designs roughly approximating the recent spreading type and hydracone draft tubes were installed by some of the water wheel pioneers. The function of a draft tube is to allow the turbine to be placed above ordinary tail water level and to convert into usable power the energy of the water tied up in its high velocity as it leaves the wheel. This is done by gradually reducing the water velocity from about 20 ft per second at the top of the draft tube to say 4 ft per second at the discharge end of the draft tube.

Governors for maintaining constant speed of rotation are an essential accessory to turbines. A governor requires a pair of flyballs, driven at the speed proportional to the speed of the turbine either by a belt connection or by an alternating current motor connected directly to the generator which the turbine drives. If, on account of decreased load, the turbine speeds up, the flyballs are raised and a valve opened which causes oil or water pressure to pass in the 'servo-motor' cylinder at the end which will press a piston in the direction required to close the widest gates of the turbine, or, in case of a Pelton wheel, to deflect the nozzle stream. When electric load is demanded of the unit, the speed slows down slightly and the lowered position of the flyballs adjusts valves to admit pressure to the other end of the servo-motor cylinder, thus opening the turbine gates. Good practice in regulation of speed depends upon circumstances, but to give an approximate idea it may be mentioned that one very modern

plant has a speed change of not over 17 per cent for a load change of 10 per cent.

Simultaneously with the development of higher efficiencies and more economical settings and larger units, the development of automatic hydroelectric stations has reached a stage where several such plants are now operating. The starting and shutting down of these plants is accomplished by a clock in the station or by throwing a switch in another station of the same system perhaps miles away.

*Storage and Transmission of Power*—The principle underlying the action of hydraulic machines connected with the storage and transmission of power was enunciated by Pascal more than two hundred and fifty years



*Runner of Pelton Impulse Turbine  
Equipped with Patented Ellipsoidal  
Buckets*

ago in the following words: 'If a vessel full of water, closed on all sides, has two openings, the one a hundred times as large as the other, and if each be supplied with a piston which fits it exactly, then a man pushing the small piston will exert a force which will equilibrate that of 100 men pushing the large piston, and will overcome that of 99.' Though this principle was known so long ago, little practical use was made of it until 1796.

Hydraulic machinery for the storage and transmission of power owes its success largely to the late Lord Armstrong in England. He at first used a reservoir on a high tower as a storehouse for energy, pumping water into it. About 1850 he hit on the hydraulic accumulator as a means of producing an artificial head.

*The Application of Hydraulic Power*—*Hydraulic Cranes*—The hydraulic crane is some what like an ordinary pulley-tackle reversed, the hydraulic power being applied by a ram

acting at the load-end of the tackle, the weight raised occupying the place usually assigned to the hand or power. Thus the ram moves much more slowly than the load raised. For instance, take a crane with three cylinders, the rams of which actuate one cross-head, from which the lifting chain passes over multiplying sheaves to the crane jib. Either one, two, or all the rams could be put under pressure, and hence the amount of water (or hydraulic power) required could be varied with the load raised. Without some such arrangement any hydraulic machine raises its smallest load, or does its least amount of work, at the same cost as its greatest.

**Hydraulic Elevators**—Hydraulic elevators or hoists are distinguished from cranes by the fact that the load raised must always take the same vertical path, being placed in a cage or room which travels on fixed vertical guides.

**Suspended Elevators**—The elevators in use in the finest buildings in America are mainly of the suspended type. In these the cage is suspended usually by four wire ropes, each of which is strong enough to bear the whole load with safety. The ropes are pulled up by a short ram which works in its cylinder, and has multiplying sheaves like a hydraulic crane. No deep well is required for the cylinder, and the speed of the elevator may be much higher than in the case of the direct-acting apparatus. Every elevator of this kind must be supplied with a safety device, the function of which is to arrest the cage should the ropes break or be paid out too rapidly. See ELEVATOR.

**Canal Lift Locks**—Not only have hydraulic elevators been provided for passengers and goods, but even a section of a canal with one or two boats in it is moved from one level to another by hydraulic power.

**Hydraulic Engines**—It is often necessary to use hydraulic power for driving shafts and machines which have a rotary motion. To do this a hydraulic engine may be employed. It is like a steam-engine, but is driven by water under pressure instead of by steam.

**Hydraulic Machinery on board Ships**—The manipulation of heavy guns on ships of war, with the provision of recoil-absorbing apparatus, and the moving of heavy turrets, and operations of a similar nature, are sometimes performed by hydraulic power. The magazines are fitted with hydraulic capstans, purchases (or cranes), and hoists for dealing with the ammunition. The absence of risk of fire or explosion is one of the chief reasons

for the adoption of this class of power for these purposes.

**Hydraulic Brake**—Hydraulic appliances may also be used to destroy motion or waste energy. The simplest appliance of this kind is the ordinary dash-pot, which is a cylinder filled with oil or water, containing a piston which either fits loosely or has holes in it for the passage of the fluid. The body whose motion is to be 'damped' acts on the piston, forcing it along the cylinder, the fluid passing through the holes or round the piston, and by friction, wasting the energy of the moving body. In a better form of apparatus the piston fits the cylinder, the two ends of the latter being connected by a pipe through which the fluid passes as the piston moves. The following are a few of the authorities which may be consulted: Church's *Hydraulic Motors* (1905), Williams and Hazen's *Hydraulic Tables* (1905), Mark's *Hydraulic Power Engineering* (1905), Hasluck's *Pumps and Hydraulic Rams* (1907), Beardsley's *Design and Construction of Hydro-Electric Plants* (1907), Thurso's *Modern Turbine Practice and Water Power Plants* (1907), Bodmer's *Hydraulic Motors and Turbines*, Ball's *Natural Sources of Power* (1908), Lyndon's *Development and Electrical Distribution of Water Power* (1908), Baxter's *Hydraulic Elevators* (1910), Addison's *Treatise on Applied Hydraulics* (1944).

**Hydraulic Ram** In this machine, invented by J. M. Montgolfier in 1796, a large quantity of water under low head is used to raise a smaller quantity of water from the same or another source to a higher point. Hydraulic rams are not highly efficient, and usually are adapted only for moderate output. They are used chiefly for isolated dwellings near a stream that affords some fall of water.

#### Hydraulics See Hydro-mechanics

**Hydrazine**,  $\text{H}_2\text{N}-\text{NH}_2$ , is a colorless liquid (b.p.  $114^\circ\text{C}$ ) that can be prepared by heating hydrazine hydrate with barium oxide. It is alkaline, uniting with acids to form salts, and with water to form a stable hydrate.

**Hydrea**, now **Hydra**, a small island in the Gulf of Hermione, on the s.e. coast of Argolis, is famous for the gallant part its inhabitants played in the Greek war of independence. On its n.w. coast is the fortified seaport town of Hydra, with an active trade. Its seamen are reputed the best in the Levant, p. 6,500.

**Hydrides**, in the widest sense of the term are the compounds formed by the union of

hydrogen with a single other element, but the name is more often restricted to the compounds of hydrogen with metallic or semi-metallic elements

**Hydriodic Acid**, hydrogen iodide, HI, a heavy, colorless, sharp-smelling gas, may be prepared by acting on red phosphorus and iodine with water, or, in solution, by passing hydrogen sulphide into water in which iodine is suspended, and filtering off the sulphur precipitated. The medicinal acid is of 10 per cent strength. The iodides, or salts of hydriodic acid, are crystalline, and, as a rule, soluble in water.

**Hydrobromic Acid**, hydrogen bromide, HBr, is prepared by heating potassium bromide with phosphoric acid, or by cautiously dropping bromine into red phosphorous made into a paste with water. Bromides of potassium, sodium, and ammonium are used in medicine, being powerful depressants of the nervous system and hypnotics.

**Hydrocarbons** are compounds of hydrogen with carbon, and may be looked on as the parent substances from which all organic compounds are derived. There are many classes of hydrocarbons, of which the following are the chief—(1) The paraffins of general formula  $C_nH_{n+2}$ , which are saturated compounds with the carbon atoms in an open or branched chain. These occur in natural gas, and make up petroleum. (2) Unsaturated hydrocarbons of several series, such as the ethylene series, of general formula  $C_nH_n$ , the acetylene series,  $C_nH_n$ , etc., all of which will unite with other elements, like chlorine, without rearrangement of the molecule. (3) Hydrocarbons with a ring structure (cyclic), such as the benzene, naphthalene, and anthracene hydrocarbons, in which the carbon atoms are arranged in one or more closed chains.

**Hydrocele**, a swelling of the scrotum, caused by the effusion of fluid into the space between the serous layers of the tunica vaginalis, which covers the testicle. It forms a tense, elastic, smooth swelling, and it is distinguished from other conditions in the same situation by its translucency.

**Hydrocephalus**, or water on the brain, is a condition of the head caused by excess of fluid under the brain coverings or in the brain coverings or in the brain cavities (ventricles). The former is rare, and the latter not uncommon. There is an acute form due to tubercular meningitis, and occurring most frequently in children between the ages of two and five years, but the usual form is chronic and the

cause is often unknown. In a large proportion of cases the disease is congenital. A hydrocephalic child seldom lives more than four or five years. Chronic hydrocephalus (acquired) in adults may result from cerebrospinal meningitis, or from occlusion of the foramen of Magendie by a tumor, or it may be idiopathic—arising independently, apart from other disease. Hydrocephalus is, however, rather a symptom than a disease, but acute cases are generally accompanied by the ordinary signs of inflammation, and acquired chronic hydrocephalus, when arising from the pressure of a tumor, is often associated with intense headache and drowsiness, which may end in coma and death.

**Hydrochloric Acid**, or **Muriatic Acid**, hydrogen chloride, HCl, is found in nature in some volcanic gases. The gas is prepared by heating common salt with concentrated sulphuric acid. Hydrogen chloride is a pungent, colorless, fuming gas of suffocating odor, that is heavier than air and very soluble in water, forming a fuming monobasic acid—hydrochloric acid, 'spirits of salt,' or muriatic acid. The pure concentrated acid is about 36 per cent, while that used in medicine is 10 per cent in strength. The series of salts, the chlorides, derived from hydrochloric acid, are widely distributed and of great importance. In general they are crystalline, stable, and soluble (except silver), though some are decomposed by water, especially if evaporated with it. Common salt, sodium chloride, NaCl, is the most important of the chlorides, from which almost all chlorine and its compounds are made, as well as all of the sodium compounds. Common salt, besides its use as food and as a preservative is useful as a gastric stimulant.

**Hydrocyanic Acid**, or **Prussic Acid**, HCN, was discovered by Scheele in 1782, and is a product of the decomposition of the amygdalin present in bitter almonds, wild cherry, laurel, peach kernels, etc. An aqueous solution may be prepared by distilling potassium ferrocyanide with diluted sulphuric acid or by acting on potassium cyanide with tartaric acid. The only acid sold is two per cent strength. It is intensely poisonous, even if only absorbed through the skin, or if its vapor is inhaled, while a single drop of the anhydrous acid if swallowed, causes instantaneous death by paralysis of the heart.

Chemically, hydrocyanic acid is a feeble acid, faintly reddening litmus. It forms salts, the cyanides that are in some respects like the halides, but are poisonous, and enter into

complex acid radicals like the ferrocyanides and ferricyanides. In dilute solutions, hydrocyanic acid is used medicinally. Potassium (or sodium) cyanide is useful as flux and reducing agent, as fixing agent in photography, but chiefly as a solvent for gold.

**Hydrodynamics** See **Hydrokinetics**, **Hydrostatics**

**Hydro-Extractor**, or centrifugal, is a machine for separating liquids, such as water, from solids, by whirling the mixture in a power-driven perforated or wire cage surrounded by a casing to collect the liquid that flies out through the openings.

**Hydrofluoric Acid**, or **Hydrogen Fluoride**, HF, is obtained in aqueous solution by heating calcium fluoride (fluorspar) with concentrated sulphuric acid in a leaden or platinum retort, and condensing the gas given off in water ( $\text{CaF}_2 + \text{H}_2\text{SO}_4 = \text{CaSO}_4 + 2\text{HF}$ ). If potassium hydrogen fluoride is prepared by half neutralizing the aqueous acid, the anhydrous acid can be obtained by the distillation of the dried salt in a platinum retort. Anhydrous hydrofluoric acid is a colorless liquid, boiling at  $19^\circ \text{C}$ , and giving off most irritating and corrosive fumes. Hydrogen fluoride (commercial, about 36 per cent) is valuable on account of its solvent action in silica and silicates, being largely used to etch glass. Calcium fluoride is the most important, and forms clear cubical crystals. Besides its use as a source of hydrofluoric acid, it is employed as a flux in metallurgical operations. Ammonium fluoride is sometimes used as a beverage preservative.

**Hydrofluosilicic Acid**,  $\text{H}_2\text{SiF}_6$ , is obtained by leading silicon fluoride, obtained by the action of concentrated sulphuric acid on a mixture of fluorspar and fine sand, into water, hydrated silica being simultaneously formed. Hydrofluosilicic acid is only known in solution, which is colorless, sour, and behaves as a diacidic acid, forming somewhat insoluble potassium and barium salts.

**Hydrogen**,  $\text{H}$ , 1.008, is a gaseous element that chiefly occurs in nature in combination with oxygen as water. It was first recognized as a distinct substance by Cavendish in 1766, though the formation of an inflammable gas by the action of acids on metals had been noticed earlier. Hydrogen is most conveniently prepared on a small scale by displacement from diluted sulphuric acid by zinc,  $\text{Zn} + \text{H}_2\text{SO}_4 = \text{ZnSO}_4 + \text{H}_2$ . On a larger scale, scrap iron may be substituted for zinc, or steam may be passed over red-hot iron, or water electrolyzed. Hydrogen is a colorless, odor-

less gas that condenses to a liquid at  $-253^\circ \text{C}$  and a pressure of 180 atmospheres, boils at  $-252^\circ \text{C}$ . It is the lightest known substance, 1 litre of the gas weighing but 0.08995 gram, while the liquid has but 0.6 of the density of water. Hydrogen is very insoluble in water, and though not actively poisonous, is incapable of supporting respiration. Hydrogen burns in air with a non-luminous flame, exploding if previously mixed with the air, or oxygen, and in either case forming water by union with the oxygen. Hydrogen unites with many elements to form compounds of very varied properties. Thus it forms water with oxygen, hydrochloric acid with chlorine, and sodium and palladium hydrides with the respective metals.

See also **HEAVY WATER** for recent discoveries and work on isotopes. Hydrogen is used as a reducing agent, as a means of producing high temperatures in the oxyhydrogen flame (about  $2,500^\circ \text{C}$ ), and for filling balloons.

**Hydrogen Peroxide**, or **Hydrogen Dioxide**,  $\text{H}_2\text{O}_2$ , is probably present in natural waters exposed to sun and air. It is obtained by the action of dilute sulphuric acid on hydrated barium peroxide, barium sulphate being precipitated, and the aqueous solution concentrated by evaporation on a water bath, followed by fractional distillation under reduced pressure. Hydrogen peroxide is a somewhat viscous liquid of faint blue color that mixes with water in all proportions. Hydrogen peroxide is a powerful oxidizing agent displacing iodine, converting sulphides to sulphates, and bleaching by oxidation, etc. It acts as a natural disinfectant. The commercial solutions contain three per cent, yielding ten volumes of oxygen.

**Hydrographic Office**, in the United States, is an institution of the Navy Department. Among its statutory functions are the improvement of the means for navigating the vessels of the navy and of the mercantile marine by preparing and providing nautical charts, sailing directions, manuals of instruction, and works on nautical astronomy, with the purpose of arriving at that stage of national advantage in which the nautical publications of the United States shall be sufficient to insure the security of the nation's shipping in all parts of the world. See **HYDROGRAPHY**, **MAGNETISM**, **TERRESTRIAL**.

**Hydrography** is the physical geography of the waters of the earth. It embraces the description of rivers, lakes, and of all the marine areas of the globe. Hydrography treats of the contours of the ocean bed from

the sea-level down to the greatest depths, the temperature, circulation, physical and chemical properties of seawater, the currents, tides, and waves, the composition and distribution of marine deposits, the aspects of biological oceanography, and the relations of man to the ocean in the development of navigation, commerce, and civilization. The name Hydrography is applied to the art of making nautical coast surveys. Such surveys are usually connected with trigonometrical and topographical surveys, which serve to lay down the shore lines and locate the objects above water, and to provide a basis for the subsequent operations of representing the depths of water over the shoals and in the channels. See CHART.

**Hydrokinetics** is that branch of the subject of hydrodynamics which deals specially with the motion of fluids under the action of force. Various types of fluid motion may be discriminated. The simplest of all is that of uniform steady motion. By uniform motion is meant motion which is the same in direction and magnitude at all points, so that the mass of fluid which is moving in this manner moves as if it were solid, and may be treated mathematically as such. No account is taken of the fact that a fluid may be regarded as a system of molecules, and we limit the discussion to an ideal fluid from which friction is entirely absent. Nevertheless, except in the cases of the more viscous fluids, the results correspond closely with actual facts, and the general nature of the deviations friction brings in can always be allowed for.

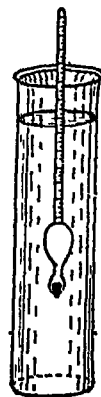
The study of hydrokinetics to any extent requires a moderate knowledge of the differential calculus, and also of the integral calculus. Any one so equipped will find a very full discussion in Lamb's *Hydrodynamics* (1895), or a less extended treatment in Basset's *Elementary Treatise on Hydrodynamics and Sound* (2d ed., 1900).

**Hydrolysis**, the term applied to those chemical actions in which decomposition is brought about by the action of water.

**Hydromechanics**, the science dealing with the application of liquids as motive power for machinery. Hydromechanics is usually taken to embrace so much of the purer sciences of hydrostatics and hydrodynamics as concern the principles of machinery and is included in the wider term hydraulics.

**Hydromel**, a beverage, either fermented or unfermented, composed of honey and water. When fermented it is called mead.

**Hydrometer**, or **Areometer**, an apparatus for measuring, or more strictly comparing, the densities of liquids. There are various forms, but all are direct applications of the hydrostatic principle of Archimedes, which states that when a substance is wholly or partially immersed in a liquid, its apparent weight is diminished by the weight of the liquid which has been displaced. When the substance floats in the liquid, the weight of the amount of liquid displaced will be exactly equal to the weight of the body, hence



Hydrometer

more or less of the floating body will be immersed according as the liquid is lighter or heavier. A sensitive hydrometer is incapable of measuring densities through a great range, hence it is necessary to construct different forms for measuring correspondingly different groups of liquids. See DENSITY and SPECIFIC GRAVITY.

**Hydrophathy**. See **Hydrotherapy**.

**Hydrophobia**, or **Rabies**, is a disease communicated by a bite from a rabid animal. It is nearly always caused by the bite of a dog, but any animal, even man himself, may communicate it to another. The dog in the U. S. and Europe, the jackal in India, the pariah dog in Egypt, and the wolf in Russia are the animals from which hydrophobia is mostly derived. From six weeks to two months usually elapse before the onset of symptoms, but the time may be shorter, or even longer. The temperature gradually rises to  $101^{\circ}$  or  $103^{\circ}$  F., and the symptom develops which has given the disease its name. Violent and painful spasms of the throat follow any attempt to swallow liquids, and the patient dreads such attempts. He also becomes extraordinarily sensitive to sounds and vibrations. He may become delirious, and at-

tempt to bite his attendants. The disease ends in death from general exhaustion, or from heart-failure, or from asphyxia due to the spasms of the throat.

The Pasteur Treatment is treatment by hypodermic injections of the attenuated or weakened poison of rabies. Pasteur found by experiment that an injected extract from the spinal cords of rabbits which had been inoculated with the virus was too weak to cause hydrophobia if the cords were kept dry for a certain time. Further, he found that after injecting the extract from cords which had been dried ten days, he could safely inject newer, and therefore stronger, extracts, until at last he reached a strength of injection which under ordinary circumstances would produce hydrophobia. Then he discovered that the graduated doses give immunity from an inoculation that would otherwise be fatal. Patients who have been bitten by a rabid animal are now put through a graduated series of injections, and it is claimed that the mortality is greatly lessened by this treatment if only it is adopted in time. Dogs are now frequently inoculated against rabies but this treatment has not proved entirely effective.

**Hydroquinone**, para-dihydroxy benzene  $\text{C}_6\text{H}_4(\text{OH})_2$ , is prepared by the oxidation of aniline to quinone by potassium bichromate and sulphuric acid, followed by reduction of the product by sulphurous acid and extraction with ether. Hydroquinone is a colorless, odorless crystalline solid (m.p.  $169^\circ \text{C}$ ), that has a slightly sweet taste. It is somewhat soluble in water, gives a green color with ferric chloride, and acts as a reducing agent, being used for that purpose in photographic developers.

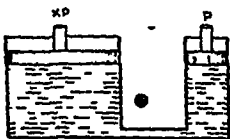


Fig 1

**Hydrostatics** is the science which treats of the application of forces to fluids in such a way that no motion ensues. Consider the equilibrium of the cylinder in the direction of its length. By the definition of a liquid these pressures are normal to the surfaces concerned and the pressure on the curved surface will not balance any of the pressure on the end. Thus, if there be any increased pressure on one end, there must be an equal

increase on the other end, for the weight of the liquid will not alter. Hence we have the theorem, 'Any increase of pressure at one point of a liquid is at once transmitted to every other point.' This theorem is taken advantage of in the hydraulic press, which

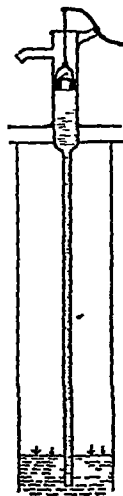


Fig 2

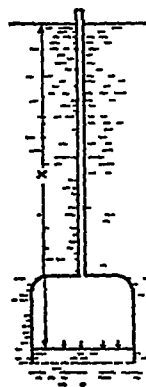


Fig 4

consists essentially of a large and small cylinder, each fitted with a piston and filled with fluid, and connected together (Fig 1). Let the large cylinder have a cross-section  $x$  times the smaller. Then if  $p$  pounds be put on the smaller piston, since the pressure transmitted is  $p$  on every area equal to the cross-section

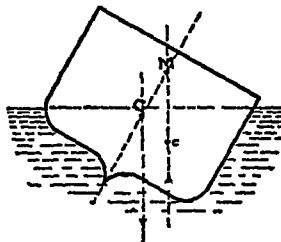


Fig 3

$C$ , Center of gravity of floating body,  $c$ , centre of gravity of displaced water,  $M$ , metacentre

of the small cylinder,  $xp$  must be put on the large piston to keep it down. By making  $x$  very large an immense force is developed. Again, consider a horizontal cylinder in a fluid. The pressures on the curved sides balance each other. The weight acts vertically,

and therefore the pressures on the flat ends of the cylinder balance each other. Hence we have the theorem, 'The pressures at two points in the same horizontal plane are equal.' A particular case of this is the ordinary observation that 'water finds its own level.'

Let our cylinder now be vertical. As before, the pressures on the curved sides will balance among themselves, and the pressure on the bottom will be balanced by the pressure on the top, together with the weight of the cylinder of liquid. Thus the difference of pressure between one part of a liquid and another point at a different level is equal to the weight of a column of liquid of unit cross-section, and of a height equal to the difference in level. This theorem is applicable to most of the ordinary hydrostatic instruments—e.g. the barometer, the suction pump, the siphon, and balancing columns. In the mercury barometer, for example, the column of mercury is kept balanced by the pressure of the air. When this increases or diminishes from any cause, the column gets longer or shorter. The action in the suction pump is similar to that in the barometer. When the piston is withdrawn, the pressure of the air forces water into the barrel (Fig 2). The efficiency of the pump is thus limited by the pressure of the air, and water cannot in consequence be 'sucked' higher than about 33 ft.

The densities of liquids are frequently got by an application of this theorem. The heights of two liquids that balance each other in a tube bent in the shape of a long U are noted. Since they balance, they have equal pressures, and we know therefore that the height of the first multiplied by its density is equal to the height of the second multiplied by its density. If we know three of these quantities, the fourth can be calculated. Further, from this theorem follows the 'principle of Archimedes,' which may be stated thus: A body when immersed in a liquid is buoyed up by a pressure equal to the weight of liquid displaced by the body. Thus we may obtain the volume, and hence the density of a body by weighing it in air and in water, and remembering that the weight of one cubic centimeter of water is one gram. An instrument depending on this principle is the hydrometer. See **HYDROMETER**.

The position of the metacenter in a ship can be obtained by a consideration of the principle of Archimedes. The pressure of the water on a ship acts in a line vertically through the center of gravity of the dis-

placed water (Fig 3). A gas differs from a liquid in the lesser cohesion of its particles. From the present point of view the chief differences are these: firstly, a gas is very compressible, whereas a liquid is nearly incompressible, and secondly, a gas has comparatively little weight. Hence, while the above theorems apply to gases, they are not relatively so important as the two laws of Boyle and Charles giving the relation between the volumes, pressures, and temperatures of gases. (See **GASES AND VAPOR**) Boyle's law becomes practically important, for example, in the case of the diving-bell (Fig 4). Now, if the surface of the water inside this apparatus be 1 foot below the level of the surface outside, this means that the pressure on the air in the bell is greater than the pressure of the outside air by the pressure of a column of water 1 ft high. Thus the pressure of the air inside is approximately 1 + 33

atmospheres, 33 ft being the ap-

33

proximate height of the water barometer. Though gases have little weight, this is not negligible, as may be seen in the case of the atmosphere. Its pressure is due to its weight. On going up a hill, therefore, we find that the barometer falls. The fall near sea-level is approximately one inch for every thousand ft, but at higher altitudes the rate is lower, owing to the diminished density of the air. We can thus estimate the height of a hill by the fall of the barometer.

**Hydrotherapy**, in medicine, is treatment of disease by water, whether externally or internally applied. The cure of disease by water was known to the ancient Greek, Roman, and Arabian physicians. French and German physicians have paid considerable attention to the matter, and in the United States of America a great deal of strictly scientific work has been done in connection with hydrotherapeutics. For therapeutic purposes water may be applied externally by means of baths, douches, sprays, wet packs, and fomentations, while internally it may be administered by the mouth, or used for the lavage of various cavities. See **BATHS**. Consult Baruch's *Principles and Practice of Hydrotherapy* (1908), Baithel's *Hydrotherapy* (1944).

**Hydrothorax** (derived from *hydor*, 'water,' and *thorax*, 'the chest') is the term applied to dropsical collections in the pleura. See **DROPSY**, **PLEURISY**.

**Hydrotropism**, the tendency of growing

plants to curve in response to the influence of unequal degrees of moisture with which they come in contact. See **PLANTS**.

**Hydroxylamine** ( $\text{NH OH}$ ), may be regarded as ammoniac ( $\text{NH}_3$ ) in which one of the hydrogen atoms has been replaced by the compound radical hydroxyl ( $\text{OH}$ ). It is a powerful reducing agent, and a strong poison, and is deadly to micro-organisms.

**Hydrozoa**, a class of the phylum Coelenterata which includes the simplest forms of animal life. The hydrozoa are characterized by the absence of such mesenteries and partitions as divide the general cavity of sea anemones, the mouth leading directly into the body cavity without the intervention of a gullet, by the structure of the body in two layers, ectoderm and endoderm, by the fact that the reproductive cells usually arise from the ectoderm, and by the possession of nettle cells. They occur in both fresh and salt water, and may be either free floating or fixed, simple or colonial. Fresh-water forms are the *Prothysa*, *Microhydra*, and *Hydra*.

Two distinct structural types of hydrozoa occur—the *polyp* or *hydroid*, and the *medusa*, a small swimming bell or jelly-fish—both of which may arise in the same life cycle, with a resulting alternation of generations characteristic of most forms of the class (see **ALTERNATION OF GENERATIONS**). Existing hydrozoa embrace four orders, the first two of which are sometimes grouped together under the heading **HYDROVIRIDUSAR**: (1) *Leptothinae*, typical polyp colonies, some permanently fixed, such as the *Sertularians*, others liberating swimming bells, (2) *Trichylinae*, which have no polyp stage, but comprise only free-swimming medusae produced directly from the eggs of the jelly fish, (3) *Hydrocorallinae*, typical of which are the tropical *Millepores*, fixed colonies which possess the power of forming corals, show much division of labor among the members of the colony, and reproduce by budding, (4) *Siphonophora*, free-floating colonies, which also show much division of labor, exemplified in the Portuguese Man-of-War. A fifth order, *Graptolithoidae*, now extinct, belonged to Paleozoic times. See **COELENTERATA**.

**Hydrus**, a south polar constellation, added by Bayer in 160,

**Hyen**, see **HYAENA**.

**Hieres**, or **Hieres**, town, department Var, France, on the Riviera, 11 m. e. of Toulon, and 1 m. from the sea. It is a favorite health resort. The climate is mild and dry, though the mistral is sometimes disagreeable.

The plain of Hieres is a field of roses. Palm and orange groves add much to the beauty of the town, p. 21,339.

**Hygieia**, in classical mythology the goddess of Health, was the daughter of Aesculapius. In works of art she is usually represented as a virgin, with a snake, the symbol of health, which drinks from a cup held in her hand.

**Hygiene**. The word Hygiene, derived from a Greek root signifying 'healthy' or 'sound' (see **HYGIEIA**), has commonly been used to include the whole art of preserving health, by whatever means. German writers still use the term in this wide sense. In the United States it is usual to make a distinction between the control of external or environmental conditions which may produce disease, and the conduct of the individual life so as to keep the body itself in a state of maximum health. The environmental, community problems are grouped under the head of **SANITARY SCIENCE**, while the term Hygiene is restricted to the field of personal habits. The word Hygiene is here used in this limited sense.

The human body is in a quite literal and exact sense a living machine, made up of parts or organs which work together according to more or less clearly understood physical and chemical laws. Disease ensues either as a result of inherited defect, an initially weak spot in the machine, as the outcome of careless use of the machine itself, with resulting over-strain of some part of it, or as the effect of some external agent. The first of these three causes can be reached only through **EUGENICS**, but it is the ideal of Hygiene so to conduct the daily life of the individual as to conserve at a maximum the efficiency which his inherited constitution makes attainable. Dissipation of energy and wastage of tissue substance must be as constantly made good by supplying the body with the proper kind and amount of food.

Air is of course as essential as food to the conduct of the life process, because this process in its essence is an oxidation, a union of food constituents with the oxygen of the air. The muscles—the heart—the blood vessels, the lungs, and all the other organs of the body require normal exercise to keep them in good condition. Since exercise of the muscles exercises most of the other organs as well, a reasonable amount of muscular activity is an essential factor in personal hygiene.

Since activity of any part of the body not only uses up energy, but produces poisonous



waste products which the excretory processes take time to remove, rest is essential as exercise to the normal operation of the living machine. Food, Fresh Air, Exercise, and Rest have been rightly described as the four main pillars of the temple of health, and its foundation must be built on moderation. The body needs food, first of all, to supply the energy necessary for the life process. Such food energy is measured in calories, one calorie being the quantity of heat energy necessary to warm two quarts of water one degree Centigrade (see CALORIE).

The daily amount of food energy needed for a normal adult is 2,500 calories for a sedentary life, rising to 3,000 calories for a physical worker. It is not merely the total amount of food which is important, but the proportions of its principal constituents. Among the well-to-do it is probable that many persons suffer from overeating or from too high a proportion of protein in the diet. The protein in the food should make up about 10 to 15 per cent of the total calories, or 3 to 4 ounces a day. A helpful guide to the proportioning of the diet is from Fisher and Fisk's *How to Live*, which classifies some of the commoner foods as to their richness in protein and fat—those low in both being of course high in carbohydrates.

Except for the tendency to eat too much meat, the normal instincts take pretty good care of the selection of the diet in those who are unlimited as to income. Among the poor, however, the danger of under-nutrition, lack of calorific value, or more generally lack of certain specific food substances, becomes a serious problem. A supply of 2,500 to 3,000 calories of energy per day, of which 10 to 15 per cent is in the form of protein, and including a fair proportion of fresh vegetables and fruits and of fibrous bowel stimulating food, is the essential in a proper diet (See FOOD, DIET).

The alimentary canal, which begins with the mouth and runs down through œsophagus and stomach to the small and large intestines, is lined with very delicate membranes, and equipped with special organs, some of which are specially liable to serve as portals for invading germs of disease or for the absorption of microbic poisons. First of all under this head must be considered the hygiene of the teeth. The teeth are protected by a hard layer of enamel, but if particles of food are left between them the bacteria which develop form chemical substances that act on the

enamel and destroy it. Once the enamel is dissolved, certain types of bacteria work their way down toward the nerve until severe toothache results. This is by no means the worst of it, however, for certain types of bacteria which enter the body by way of a decayed tooth may cause rheumatism or kidney trouble or fatal heart disease. The toilet of the mouth should be made night and morning at least, and preferably after each meal (See DENTISTRY).

The other portion of the alimentary tract which requires special attention, aside from the general question of the food submitted to the digestive system as a whole, is the intestine. Here the principal absorption takes place from the food as it passes along, and if the mass does not pass, but remains too long in the intestine—particularly if the food be largely nitrogenous—unpleasant and dangerous products of bacterial decomposition will be formed, and absorbed into the body along with the food elements themselves. The remedy is a free movement of the bowels, so that the food masses may not have time to decompose too far, and at least one regular movement a day is necessary to health. Constipation should not be treated by medicine, except in special cases and under medical advice, but the remedy should be sought by eating bulky foods, fruits, etc., and by muscular exercise to stimulate the normal healthy movements of the bowels (See CONSTIPATION).

The obvious and important effects of bad air are due not to its chemical, but to its physical properties to its temperature and humidity, rather than to its carbon dioxide. High temperature—particularly if accompanied by high humidity, which prevents evaporation—is the cause of the languor and malaise experienced in badly ventilated rooms. Furthermore, there are special influences exerted by high atmospheric temperatures upon the membranes of the nose and throat which have an important bearing upon the prevalence of respiratory diseases (See VENTILATION).

Air conditioning is in fact primarily related to the hygiene of the skin, rather than to that of the lungs, and is intimately connected with the two other hygienic problems of clothing and bathing. Aside from the general desirability of bodily cleanness, the hygiene of the skin is primarily a question of adequately training and exercising the vasomotor system. The heat-regulating machinery of the body is one of the most remarkable parts of the

living organism. We maintain a temperature of close to  $98.6^{\circ}$  F., whatever outside conditions may be, from the Equator to the Poles, and we do this mainly by the automatic adjustments of the blood vessels of the skin. Our ideal for the hygiene of the circulatory system should involve three principles: protection against excessive heat, protection against excessive cold, and the provision of a sufficient stimulus of moderate cold to train the blood vessels of the skin to prompt response in time of need. First of all, overheating of living rooms and the swaddling of the body in too heavy clothing should be carefully avoided. Above all, the habit of sleeping outdoors or with windows freely open top and bottom, of living outdoors as much as possible, and of keeping living rooms cool, will do wonders in building up the general vigor of the body and its resistance against disease.

The muscles make up more than one-half the total weight of the human body, and their proper use is essential, not only for their own growth, but on account of the interrelation between the health of the muscles and that of the rest of the organs. Vigorous physical exercise not only develops the muscles themselves, it stimulates the heart and the blood vessels, it deepens the respiration, it keeps up the tone of the digestive system, it frees the tissues from the accumulation of harmful waste products. Correct posture of the body is a first essential in the hygiene of the muscular system, for the position of the bony skeleton and of many of the softer organs of the body depends on the maintenance of a proper muscular tone. When standing, the head, body, and legs should be so poised, one above the other, that a line dropped from the front of the ear will fall within the forward half of the foot. The shoulder blades should be flat across the back, and the feet should be directed straight forward (not outward). The best exercises—aside from those designed for the correction of special defects—are those which develop as many as possible of the different muscles of the body. Such exercises are brisk walking and running, rowing, riding, swimming, tennis, baseball, and football. It is better to exercise in the open air than indoors, and exercise in the form of games is better than exercise taken merely for the sake of exercising, since games develop the eye and the brain as well as the muscles. (See PHYSICAL TRAINING.)

The nervous system, like the other parts of

the body, needs rest to keep it healthy, and since the higher centers in the brain are active all the time we are awake, their need for rest is particularly great. Fatigue after great labor, physical or mental, is caused by the fact that the muscles or the nerves have been worked so hard that waste products have collected too fast to be carried off by the blood, and are poisoning the tissues which produced them. Fatigue is nature's danger signal, and should always be heeded. With a proper variety of work it is marvellous what the human mind and hand can accomplish, but they cannot stand too long a pull without interruption. A cheerful person can do far more work and feel less tired than a cross and worrying one.

There are a great many ways of resting the brain and nerves. Some naturally active people are rested by playing hard, and some by other recreations which have the power of resting and really *re-creating* their minds. It is a good thing for almost every one to have some hobby. The only complete rest for both body and mind is found in sleep, and no one can keep healthy without satisfying this need. In sleep, the blood supply going to the brain is so decreased that we lose consciousness, that is, we do not think or feel or have any knowledge of what is going on about us. In this condition, the higher nerve centers have the best chance of freeing themselves of their waste products and building themselves up again for the work of the coming day. Individuals vary somewhat in the amount of sleep they need. Almost all grown people need about eight hours of sleep. Children who are growing fast and leading an active life need more—ten hours at least, while babies sleep from fifteen to twenty hours out of the twenty-four.

The general principles of hygiene are in greater or less measure applicable to all normal individuals, but for those who are affected with serious abnormalities there are special rules which come into play. To coin a somewhat contradictory phrase, there is a Pathological or Abnormal Hygiene. The patient affected with incipient tuberculosis, for example, needs special provisions for fresh air, special rules as to exercise and rest. Prompt detection of the disease process in its incipient stages is essential to success. The development of the medical inspection of school children (see MEDICAL INSPECTION OF SCHOOLS) and the movement for systematic medical examination of adults over 45—the age at which the constitutional diseases be-

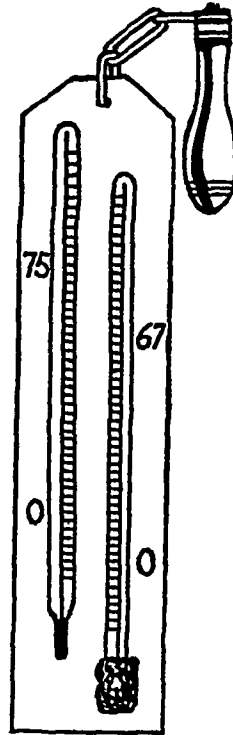
gin to manifest their effects—are tendencies of the time, for the early detection of incipient disease and its preventive care are among the most important elements in personal hygiene

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**Hygrometer**, an apparatus for measuring the humidity of the air, of which the rude instrument invented by Comers, and described in the *Philosophical Transactions* of 1676, appears to be the first specimen Hygrometers are of three kinds—those, namely, of absorption, of condensation, and of evaporation Instruments of the first class are made of various fibrous organic substances, such as hair, outbeard, and catgut, which contract or expand with variations in the humidity of the air Hygrometers of condensation experimentally illustrate the principle of the dew point (see *Dew*)

In *Dimes' Hygrometer* a vase, fitted with a pipe at the bottom, is conducted close under a plate of black glass, where it envelops the bulb of a thermometer, a cock being fitted to the vase at the base A little water and ice, or cold water only, is put into the vase and allowed to flow gently through a small chamber by turning the tap, whereupon the glass rapidly becomes dulled, and the thermometer is read The tap is then closed again, the water in the tube soon rises in temperature, and the cloudy condensation vanishes, the moment of its disappearance being that when the dew point is again reached The hygrometer in most general use is the hygrometer of evaporation, otherwise known as the *Wet and Dry Bulb Thermometer* In the form used by the U S Weather Bureau, known as the *Sling Psychrometer*, the thermometers are so mounted that they can be rapidly wheeled about the observer's head, thus affording speedy evaporation If the air is saturated, there is no evaporation, so that the two thermometers indicate the same temperature, but if the air is very dry, the wet-bulb thermometer will indicate a temperature lower than that of the air by several degrees—the difference being greater as the air is

drier From a knowledge of the two temperatures—the 'wet' and the 'dry'—and of the thermal constants of the thermometers, the humidity of the air can be estimated Practically, however, this is done by some such set of hygrometric tables as those of Prof C F Marvin's *Psychrometric Tables*, published by the U S Weather Bureau, which issues several interesting bulletins on this subject Consult *Instructions to Voluntary Observers*, by the U S Weather Bureau



*Sling Psychrometer*

**Hyksos**, or *Shepherd Kings*, the 15th and sixteenth dynasties of Egyptian rulers  
See *EGYPT*

**Hyla** See *Tree Frog*

**Hylas**, in Greek legend, a beautiful youth, the friend of Hercules, whom he accompanied on the Argonautic expedition On the Mysian coast the Naiads drew him down into the depths of the spring

**Hyllus**, in Greek legend, the son of Hercules by Deianira After his father's death he was excluded from the Peloponnesus by Eurystheus, and took refuge at Athens Later he was killed by Echemus, king of Arcadia, when trying to force his way into the Peloponnesus

**Hymans, Paul** (1865-1941) Belgian statesman, born in Brussels. From 1915 to 1917 he was Envoy Extraordinary and Minister Plenipotentiary to the Court of St James, and in 1917 was appointed Minister of Foreign Affairs in the Belgian Cabinet. He represented Belgium at the Peace Conference of Paris, and in November, 1920, was chosen president of the League of Nations. Since 1927 he has been Minister for Foreign Affairs.

**Hymen**, in Greek, the song sung by the bride's companions at wedding celebrations. From this original significance, it came to be applied to the god of marriage, who is usually represented as the son of Apollo and a muse.

**Hymenoptera**, the order of insects of the highest rank, including ant, bee, and wasp. The distinguishing characters are that there are four membranous wings, usually transparent and of unequal size, the anterior being the larger, that the mandibles are always conspicuous, though the other parts of the mouth may be converted into a suctorial proboscis, that the females are furnished with a saw, sting, or ovipositor at the end of the abdomen, that the metamorphosis is complete, the larva being more or less maggot-like. The Hymenoptera may be divided into two suborders—Phytophaga and Heterophaga, according as the 'waist' is absent or present.

**Hymettus**, mountain of Attica, ancient Greece, 3,370 ft in height, about 5 miles southeast of Athens, famous for its honey and its marble.

**Hymnody**. See **Hymns**.

**Hymns**. The word hymn, derived from the Greek *hymnos*, denotes in general a poem or song expressive of praise or adoration, specifically it is applied to metrical compositions employed in religious worship. Hymns in praise of deity form a feature of most religions. They were employed in ancient Babylon, India, Egypt, and Greece, and reached a high development in the Hebrew psalter (see **PSALMS**), the praise-book of the Jewish Church.

**ancient Christian Hymnody**—St Ambrose, bishop of Milan (d 397), is the real founder of the great school of Latin hymnody which flourished in the Western Church. St Benedict of Nursia (d c 541), by the fitting of hymns upon his Order of Worship, secured their widespread and permanent hold. Prominent names in connection with hymns of this period are St Andrew of Crete (d 732),

Charles the Great (d 814), to whom, or with more probability to his grandson, Charles the Bald (d 875), is attributed 'Come, Holy Ghost, our souls inspire', Theodulphus (d c 821), 'All glory, laud, and honor'. To this period also belong 'Blessed city, heavenly Salem,' and 'Christ is made the sure foundation'. The general characteristics of the period are the praise of God, emphasis upon the facts of redemption and exhortation. Hymns from the eleventh to sixteenth century are mainly monastic in origin, and deal largely with the lives and sufferings of saints, and especially with the growing cult of the mother of our Lord. 'Assonances,' passing gradually into rhyme, are characteristic of their form. Robert II of France composed *Veni, Sancti Spiritus*, the noble *Veni, Creator Spiritus*, 'Come, Creator Spirit,' belongs to this period. St Bernard of Clairvaux is well known as a source of hymns. The hymn by St Bernard of Cluny (12th century), 'The times are very evil' (trans by Neale), is one of the best. The famous 'sequences,' 'Dies Ira' and 'Stabat Mater,' are probably somewhat later.

**Post-Reformation Period**—Pre-reformation hymns in the vernacular seem to have been but few. With the exception of the *Veni Creator*, the Latin hymns went out and their place was taken by Psalms (see **PSALMS**) and paraphrases till the end of the seventeenth century, in the course of which original English hymns may almost be said to have had their birth. Of the paraphrases, that by Sternhold and Hopkins is the most famous, and the abiding basis of hymnody for two centuries. But Tate and Brady's collection had great influence. Prominent writers of this period are George Herbert (1593-1633), 'The Sundays of man's life,' and George Wither (1588-1667), whose *Hymns and Songs of the Church* (1623) is the earliest attempt at an English hymn-book. 'Jerusalem, my happy home,' by a Catholic, appeared about 1650. Bishop Ken's three hymns are conspicuous for the intensity of their devotional spirit. The first Baptist hymn by Benjamin Keach (1691) and the earliest Congregational hymn-book (1696) belong to this period.

From the close of the seventeenth century hymns, if not hymn writers, are numerous. Among the earliest hymnists are Isaac Watts (1674-1748) and Doddridge (1702-1751). Of these, Watts, 'the father of English hymnody,' is equalled only by C. Wesley in popularity with compilers of hymnals from the power of faith and love shown in his best

efforts Among the most popular of his hymns are 'O God, our help in ages past,' 'Jesus shall reign,' 'When I survey the wondrous Cross' J Stennett (d 1713) made a beginning of Baptist hymnody, continued by his grandson, S Stennett (d 1795), with Miss Anne Steel (1716-1778) filling the gap between The educated taste of William Cowper (1731-1800) and the spiritual fervor of John Newton (1725-1807) furnished in the *Olney Hymns* (1779) much material of permanent value The mission work of John Wesley (1703-1791) in Georgia was a turning point in the history of English hymnody His collection of 1737 was the first published for use in the Church of England He also translated from the French and Spanish His younger brother Charles (1707-88) was one of the most prolific hymn-writers of any period There are ascribed to him no less than 6,500, of various degrees of merit, including 'The strife is o'er, the battle done,' 'Jesus, Lover of my soul'

In the English Church the thirty or forty years terminating with 1850 were conspicuous for compilations Conspicuous hymns of this date are Heber's 'From Greenland's icy mountains' (1812), 'The Son of God goes forth to war,' and 'Holy, holy, holy, Lord God Almighty,' which stands in the front rank of hymns of adoration Newman, Mant, and Faber before the middle of the nineteenth century, by the attention they bestowed on Latin hymns, did much to mould the collections that followed Favorite hymns by Newman are 'Lead, kindly Light,' and (from his *Dream of Gerontius*) 'Praise to the Holiest in the height' Collections and translations made by J M Neale include the *Hymnal Noted* (1862), *Hymns Ancient and Modern*, which secured speedy and lasting popularity in England, *Church Hymns*, the *Hymnary*, etc All of these books have had great influence in raising the standard of this part of divine worship

Hymn-writers in this period are legion The following are among the best known H Kirke White (1785-1806), 'Much [Oft] in sorrow, oft in woe'—Sir R Grant (1779-1838), 'Saviour, when in dust to Thee'—Miss Charlotte Elliott (1789-1871), 'Just as I am without one plea'—H F Lyte (1793-1847), 'Abide with me,' 'Pleasant are Thy courts above'—J Montgomery (1771-1854) Montgomery may be called the first real English hymnologist His *Christian Psalmist* (1825) was at once historical and critical of the vices and defects found in many existing

hymns—Sarah Flower Adams (1805-48), 'Nearer, My God, to Thee'—D Sedgwick (1814-79) by some termed the father of English hymnology—Christopher Wordsworth (1807-85), 'Hark, the sound of holy voices,' 'O day of rest and gladness'—H Bonar (1808-89), 'I heard the voice of Jesus say'—J Ellerton (d 1893), of exquisite feeling for nature, 'Saviour, again in Thy dear name we meet'—W W How (1823-97), co-editor with Ellerton of *Church Hymns* 'O Jesus, Thou are standing,' 'For all the saints who from their labors rest'—S J Stone (d 1900), 'The Church's one foundation,' 'Weary of earth'—Rev S Baring-Gould is a well-known contributor 'On the resurrection morning,' 'Through the night of doubt and sorrow,' 'Onward! Christian soldiers'—Of women writers in the same century we may name the following Charlotte Elliott (1789-1871), 'Just as I am' (said to have been translated into more languages than any other hymn)—Mrs Alexander (to be credited to Irish hymnology, 1818-85) The gentler views of our day as to a child's relation to God are conspicuous in her hymns for little children, as compared with those of earlier time For beauty and fitness of expression these compositions of hers are unequalled 'Once in royal David's city,' 'There is a green hill far away'

Simplicity and transparency are characteristics of Welsh poetry, which has been compared to Hebrew in this respect William Williams of Pantycelyn (1717-91) is the 'sweet singer' of Wales, devout and even rapturous, while deep and mature in thought 'Guide me [us], O Thou great Jehovah,' 'O'er the gloomy hills of darkness' The singing of hymns other than the Paraphrases dates from the latter half of the 19th century In the Established Church the *Scottish Hymnal* (sanctioned 1884) is the outcome of several revisions *The Book of Hymns of the Ancient Church of Ireland*, J H Todd (1805-69), contains the fullest account of old Irish hymnody In later days Tate and Brady's *Metrical Psalter* was succeeded (c 1820) by the *Melodia Sacra* of Dr Weyman Luther set the example of writing hymns and at the same time a high mark in his 37 hymns, the greatest being the grand 'Ein feste Burg' Luther not only sang himself, he set others singing Second only to Luther in power and surpassing him in fecundity was Paul Gerhardt (1607-78) in post-Reformation times—a rich source of English and American translators For German hymno-



north wind,' in a land of perpetual sunshine, and in perfect happiness

**Hypericaceae**, an order of herbs and shrubs with terminal panicles of white or yellow flowers. Many of the included species yield a yellow juice, which in some cases possesses astringent qualities. The flowers are composed of four or five sepals, often marked with dark spots, a similar number of petals, similarly marked, numerous stamens, and a single ovary. Several species of the genus *Hypericum* are cultivated as short-lived per-



*Hypericum*, or *St John's Wort*  
1 Pistil.

ennials, but are mostly of uncertain hardiness, requiring cover in winter. Of the many species the native giant St John's wort is common.

**Hyperides** (c. 395-322 B.C.), one of the ten Attic orators, was a professional speech-writer, and in politics was, like Demosthenes, one of the leaders of the Athenian opposition to Philip, and afterwards to Alexander of Macedon. After the collapse of the Lamian war in 322, he was put to death. As an orator he may perhaps be placed second to Demosthenes. More than sixty speeches are attributed to him, but until the discovery of a papyrus about 1850 containing four speeches of his, three of which are incomplete, his writings were represented only by a few fragments.

**Hyperion**, in Greek mythology, one of the Titans, a son of Uranus and Gaea, and father of Helios, Selene, and Eos, that is, the Sun, the Moon, and the Dawn. Hyperion is often called the Sun-god by the poets and is sometimes identified with Apollo.

**Hypermetropia**, or **Longsightedness**. See **Myopia**.

**Hypersthene**, one of the orthorhombic pyroxenes, in composition a silicate of magnesium and iron. It is pinchbeck brown or green in color, and often has a bronzy sub-metallic lustre, from the presence of minute platy enclosures of doubtful nature, which reflect the light from their surfaces. It is a common rock-forming mineral and is common throughout the rocks of the Adirondack region of Northern New York which extend into Canada. It also occurs in Norway and Sweden.

**Hyperthyroidea**, or **Hyperthyroidism** (excess of thyroid principles), an abnormal condition caused by excessive activity of the thyroid gland. See **GOITRE**.

**Hypertrichosis**, a condition of abnormal growth of hair, either over the entire body or in patches where hair does not normally grow. In women, the condition is frequently associated with ovarian disease before, or with the menopause.

**Hypertrophy**, the term applied in medicine to abnormal growth of an organ or tissue. It may be congenital or acquired. The ultimate causes are often obscure. Congenital hypertrophy is usually unilateral, one side of the body being larger than the other. Acquired hypertrophy may be purely functional, fitting a part for extraordinary work, as in the case of a well-developed muscle. Irritation of a part may cause protective hypertrophy. This is seen in the skin, where a callus results from frequent pressure, and an embedded foreign body such as a bullet, or a bacillus, such as that of tubercle, is often surrounded by a wall of hypertrophied fibrous tissue.

**Hypnotics**, agents which induce sleep. They act in one of two ways, either by producing temporary anemia of the brain or by lowering the excitability of nerve-cells. Natural sleep is accompanied by cerebral anemia, and for this reason a warm bath at bedtime acts as a hypnotic, by diverting a considerable part of the bloodstream from the brain. Warmth applied to the feet, and a full meal, tend to the same result.

**Hypnotism**, a term used first by Braid (1796-1860) to cover a series of phenomena





contents of the syringe are then slowly injected, and the needle quickly withdrawn

**Hypophosphorous Acid**,  $H_2PO_2$ , is prepared by the action of dilute sulphuric acid on barium hypophosphite. It is separated from water by evaporation and crystallization, and forms a fusible white crystalline solid that is a powerful reducing agent. It forms a series of salts, the hypophosphites, which are used in medicine.

**Hypostasis**, a Greek word signifying substance or substantial existence. At first used simply to signify the divine substance or nature. But later the word hypostasis, which is the natural equivalent of the Latin *substantia*, came itself to be used to denote the one divine substance.

**Hypotenuse**, the side which subtends the right angle of a right-handed triangle. The square on it is equal to the sum of the squares on the other sides. The hypotenuse is also the diameter of the circle circumscribing the triangle, and therefore its middle point is equidistant from the three angles.

**Hypothec**, a form of property security for debt originating in the Roman law and surviving in the modern systems derived from the former. It resembles the mortgage of English and American law and may be applied either to real or personal property. It differs from the pledge (*pignus*) in the fact that it does not, like the latter, involve the transfer of the possession of the property to the creditor.

**Hypothesis** may be used widely to signify any supposition, but in the logic of science it signifies a conception or principle supposed in order to explain or bring into intelligible connection a number of given facts whose relations are not clearly understood.

**Hypsipyle**, in Greek legend, the daughter of Thoas, king of Lemnos. When the Lemnian women killed all the men in the island, she saved her father and hid him. When Jason visited Lemnos with the Argonauts, she became the mother of twin sons by him. Later, when the women discovered that her father was alive, they expelled her from the island, in her flight she was taken by pirates and sold to the Nemean king Lycurgus.

**Hyracotherium**, a representative of a family of extinct ungulate mammals, which rank as the oldest and most primitive perissodactyls. The typical genus is found in lower Eocene beds in England, France, and N America. Closely related to it were forms which are believed to be early ancestors of the

horse. The existing tapirs appear also to have been derived from this stem.

**Hyrax**, one of a group of small ungulates found in Africa, Arabia, and Syria. They are somewhat rabbit-like in appearance, hence the name coney applied to them in the English translation of the Bible.

**Hyslop, James Hervey** (1854-1920), American psychologist and psychical researcher, one of the first members of the American Society for Psychical Research. He wrote *Science and a Future Life*, *Psychical Research and Survival*.

**Hyrcanus**, Jewish high priests, one of whom was Joannes, the son of Simon Macabæus, who restored the independence of Judæa. He was the founder of the Jewish monarchy, which continued in his family until Herod secured the kingdom of Judæa.

**Hyssop**, a hardy, semi-herbaceous plant, of the order Labiatae. It has herbaceous stems springing from a shrubby base, entire,



*Hyssop* 1, Bud, 2, corolla laid open

oblong, sessile leaves, and whorled spikes of blue, labiate flowers in summer. It is strongly aromatic, pungent, and bitter, and the leaves are used as flavoring in salads, and also in the manufacture of absinthe. The dried flowers have a popular reputation as a medicine, and are also used in soups. The herb is easily



# I

I

Ibex

**I** The primary Greek and Latin value of this letter is that in the word 'machine'. Closely related is the short 'wide' vowel in 'pit'. In a general scientific notation *i* may include both groups, most modern languages use it to express these values. The sound of the English name is a diphthong, and is a value of *i* quite peculiar to English. It appears from the 15th century. *I*, in Latin, had a consonantal value also, like English *y*. Other sounds of *i* are not common in English. The Semitic value of *i* was consonantal *y*. The meaning of the Semitic name *yodh*, Greek *iota*, is 'hand'.

**Iacchus**, the name of the god Bacchus as worshipped in the Eleusinian mysteries.

**Iambic Verse**, in Greek and English prosody verses composed of iambic feet. The iambic foot is dissyllabic. In English the unaccented or short syllable stands first, being followed by one which is accented or long. Iambics are generally used in groups of five, or pentameters, usually without rhyme, when they constitute 'heroic blank verse'. When rhyming in couplets they are 'rhyming heroics'.

**Iamblichus**, Neo-Platonic philosopher, spent his life in Syria, he is believed to have died before 333 A.D. He was an ardent student of the philosophy of Plato and Pythagoras, and was also versed in the lore of the Chaldeans and Egyptians. His philosophy was a syncretism of Platonic and Pythagorean doctrines, mixed with Oriental mysticism, his cardinal thesis being that communion with the Deity was possible for man by means of theurgic rites, such as initiations and mysteries. His principal works are *The Philosophy of Pythagoras* and *On the Mysteries*.

**Ianthina**, the genus to which belong some beautiful pelagic gasteropods of a violet color called violet snails. They float at the surface of the sea, with the thin shells upturned, and feed on various kinds of jelly-fish. A special peculiarity is the 'raft,' which is attached to the foot, and is filled with air-bubbles, by means of which it sustains the attached ani-

mal at the surface of the water. They abound in the Sargasso Sea.

**Iapetus**, the 8th satellite of Saturn. It has a period of 79 days, and an orbital radius of 2,250,000 miles. Like our moon, it turns always the same face toward its primary.

**Iapetus**, one of the Titans, son of Uranus and Gæa, and father of Atlas, Prometheus, Epimetheus, and Menæceus.

**Iba**, pueb., Luzon, Philippine Is., 85 m. northwest of Manila. It has several public buildings, a telegraph office, a high school, is a meteorological station, and has an extensive trade in rice, p. 6,000.

**Ibadan**, tn., British colony of Lagos, W. Africa. Inhabitants are chiefly natives living in mud huts. Lagos by rail (opened in 1901), p. 175,000.

**Ibanez, (Vicente) Blasco** (1867-1928), Spanish novelist and anti-monarchist, whose romances, *The Four Horsemen of the Apocalypse* (1918) and *Blood and Sand* (1913) had a great vogue when translated into English. His opposition to the monarchy compelled him to live abroad for many years. In Paris, his home was a center for those who were agitating for the overthrow of Alfonso XIII. One million Spaniards lined the streets of Valencia when his ashes were returned for burial after the republican revolution. Other books: *The Shadow of the Cathedral* (1903), *Our Sea* (1920).

**Iberia**. The name given by the Greeks to Hispania, or Spain, whence Iberian Peninsula. Also the ancient name for Georgia in the Caucasus.

**Iberian Sea**, that part of the Mediterranean which lies between Spain on the n. and Morocco and Algeria on the s.

**Iberville, Pierre Le Moyne, Sieur d'** (1661-1706), a French-Canadian soldier and naval commander, the founder of Louisiana.

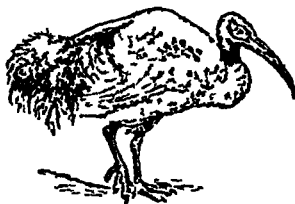
**Ibex**, a name given to four nearly allied species of wild goat the Alpine ibex, the bearded ibex of the Himalayas, a species with a wide distribution in Asia, the Arabian ibex, and the Abyssinian ibex. The first named is extinct as a wild animal, though it

is preserved by the Italian government in some of the Piedmont valleys. The habits resemble those of the Himalayan ibex. Both species are nearly uniform in color, and have their long horns ornamented with transverse ridges. The natural habitat is the margin of the snowline, where the animals live in flocks, the sexes keeping separate during a great part of the year. Two kids are produced every summer, the pairing season being in winter.



*Alpine Ibez*

**Ibis**, a family of birds related to the storks, and mostly found in warm countries. The bill is long, slender, and nearly cylindrical, tapers towards the tip, and is more or less arched. The head is always more or less bare of feathers, the tail is short, and there are generally tufts of plumelike feathers near the posterior end of the body. The most famous member of the family is the sacred ibis of the ancient Egyptians, often found as a mum-



*The 'Sacred' Ibis*

my in temples. The North American white ibis and the scarlet ibis were once numerous in the southern United States, but have been so killed off by millinery hunters that they are rare except in the remote tropics.

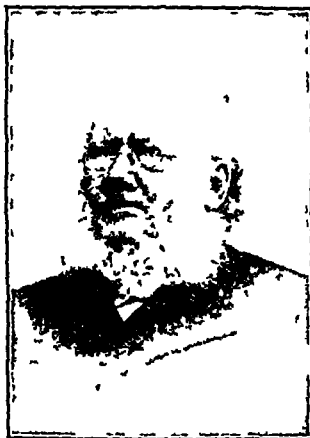
**Ibn Batûta**, Moorish traveller, whose proper name was Abu Abdullah Mohammed. He spent thirty years of his life (1325-55) in traveling through the west and south of Asia. His travels were published in 4 vols. in 1855-59 (1st ed. 1893).

**Ibn Ezra**, more properly **Abraham Ben Meir ibn Ezra** (1092-1167), Jewish scholar, also known as Abraham Judæus, Abenare and Avenara, born at Toledo in Spain, traveled through Europe, including England (1157-8). His mathematical and astronomical works throw much light upon the methods and knowledge of the Arabs in the 12th century.

**Ibn Saud**. See **Abdul-Aziz Ibn Saud**. **Ibn Zohr**, Avenzoar, or **Abu Merwan** (1072-1162), Arabian physician, wrote the work *Al-Teyyar*, considered of the utmost value, by Arab physicians.

**Ibrahim Pasha** (1789-1848), viceroy of Egypt, adopted son of Mehemet Ali, Turkish viceroy of Egypt.

**Ibsen, Henrik** (1828-1900), Norwegian dramatist and poet. The first of Ibsen's prose plays was *The Young Men's League* (1869), a political comedy written in that crisp, con-



*Photo from Ewing Galloway*

*Henrik Ibsen*

cise, pregnant prose so characteristic of the author's problem dramas. This was followed by a number of plays which reveal the dramatist as an uncompromising foe of conventionality and hypocrisy: *The Pillars of Society* (1877), *A Doll's House* (1879), widely discussed for its advanced views regarding feminine individualism, *Ghosts* (1881), a scathing criticism of the prevailing attitude toward marriage and prenuptial profligacy, *An Enemy of the People* (1882), an attack on the cowardice of public opinion. *The Wild Duck* (1884). Ibsen's later dramas are of a somewhat different cast—the moral intention being obscured by the same mys-

tical note that flashed forth so brilliantly in *Peer Gynt*. They include *Hedda Gabler* (1890), *The Master Builder* (1892), *Little Eyolf* (1894), *John Gabriel Borkman* (1896), *When We Dead Awaken* (1899).

An estimate of Ibsen's work is difficult. Hailed by some as the bearer of a gospel of emancipation and truth, he was by others passionately denounced as cynical, sordidly pessimist, realist in the worst sense of the word, gloating over the most degraded and degrading incidents and aspects of corrupt social conditions. His plays bristle with 'problems'. An idealist in his hopes of the future possibilities of mankind, he was utterly sceptical as to existing men, and especially as to existing institutions, social and political. The interest and method of his plays are almost exclusively psychological. Ibsen's *Complete Works* were published at Copenhagen in ten volumes in 1898-1902. There are English editions of the plays by Archer (new ed. 1906) and by Gosse. Consult Gosse's *Life of Henrik Ibsen*.

**Ibycus**, a Greek lyric poet of the 6th century B.C. His poems treated especially of the subject of love, but only a few fragments are now extant. Schiller's ballad *The Cranes of Ibycus* is based upon the legend that as the poet met his death at the hands of robbers, he called upon a flock of cranes to avenge his murder; later, as the cranes hovered over the theatre at Corinth, one of the murderers, seeing them, exclaimed 'Behold the avengers of Ibycus.' This led to an inquiry, and to the conviction of the guilty.

**Ica**, city, Peru, capital of the department of Ica, on the Ica River, 1,310 ft. above the sea, 150 miles southeast of Lima. The leading industries are cotton manufacture, distilling, and wine making, p. 25,000.

**Iça**, or **Putumayo**, river, Ecuador, rises in the Andes, flows southeast, and joins the Amazon near San Antonio, Brazil. It is 1,000 miles long, and in the wet season is navigable through most of its course.

**Icarus**, an Athenian who, according to legend, entertained the god Dionysus on his arrival in Attica, and was taught by him the culture of the vine. Icarus was killed by certain peasants to whom he had given wine, and who, being drunk, thought they were poisoned. With his daughter Erigone he was placed by Zeus (or Dionysus) among the stars—she as the Virgin, Icarus as Bootes or Arcturus.

**Icarus**, father of Penelope, wife of Odysseus. He promised her to the man who should

bent him in a foot-race, in this contest Odysseus succeeded.

**Icarus**, in Greek mythology, the son of Dædalus, who, in spite of his father's warnings when they were flying from Crete with waven wings, flew too near the sun. His wings melted and he fell into the sea and was drowned.

**Ice**, the solid form which water assumes below a certain temperature. It is crystalline in structure, it has a specific gravity of about 0.92, so that it floats on the surface of water, and it contracts on melting. Water under ordinary conditions freezes at 0° C., or 32° F., but if it is kept perfectly still it may be cooled to nearly -5.5° C. below freezing (=22° F.) and still remain liquid. The freezing point of water and, therefore, the melting point of ice, may also be lowered by pressure. It is this characteristic that makes skating possible, the ice melting momentarily beneath the pressure of the skates. Sea water, and salt water in general, freezes at a lower temperature than pure water.

Ice and snow in the making and unmaking are powerful geological or physiographical agents. For example, when water which has percolated into the cracks of rocks freezes, it tends by its expansion to force the crack wider, and hasten the disintegration of the rock. The resistless downward motion of glaciers or ice sheets is accompanied by a grinding of the surface over which they pass. At the present time immense masses of permanent ice occur in the neighborhood of the poles, and on mountains of a certain height in all latitudes. Ice finds an enormous practical application as a refrigerant, both in industry and in the household, and large quantities of natural ice are yearly harvested for this purpose, cut in blocks, and stored in ice houses for shipment. In recent years the manufacture of artificial ice has become an important industry. See REFRIGERATION.

**Ice, Law of**. The right to take ice forming on a private stream or lake is an incident of ownership of the bed of such stream or lake and this is, as a general rule, vested in the riparian proprietor. The public have no right to cut ice on such waters even in cases where the latter are subject to a public right of navigation. On the other hand, any person may take ice at his pleasure from public waters, like navigable rivers and the great lakes, subject, however to the superior public right of passing and repassing and to such regulations as may be enacted by law for adjusting conflicting claims.

**Ice Age** See **Glacial Period**

**Iceberg**, a fragment broken from the ice sheet which covers certain areas in the far north and south. The size of icebergs varies greatly, but bergs 60 to 100 ft to the top of their walls, with spires and pinnacles from 200 to 250 ft high, are most common. Their length is generally from 300 to 500 yds, and the depth under water is usually estimated at about seven-eighths of the entire mass. Most of the Atlantic icebergs come from the ice fields of Greenland. The greater number are encountered in April, May, and June, they have been seen as far as 39° lat and as far as 38° long.

**Ice Boating** See **Ice Yachting**

**Ice Breaker**, a specially constructed steamer used for forcing a passage through ice-bound waters. Ice breakers vary greatly in form and dimension, from small steam launches 40 ft long to enormous vessels of as much as 10,000 HP.

**Ice Caves**, or **Glacières**, perennial ice formations partially or completely underground. They occur in many different rock formations, but the rock must be either porous or broken, so that water can find its way in. Examples of ice caves occur in Iceland, Scandinavia, England, Wales, Switzerland, Russia, Germany, France, Serbia, Siberia, Japan, Korea, and in some sixty places in the United States. Among the most celebrated American examples are those at Northriver Mills, West Virginia, Decorah, Iowa, Manchester, Vermont, Williamstown, Massachusetts.

**Ice Cream**, a frozen product made from cream and sugar, or a sweetened mixture of cream and milk, with or without a natural flavoring. The fat content varies in the different grades of ice cream, but standard ice cream must contain at least 8 per cent. It is a highly nutritious and valuable food and its manufacture constitutes an important and fast growing industry. In a general way, ice creams may be divided into two classes: plain, uncooked ice cream, often known as Philadelphia ice cream, made of cream, sugar, and flavoring, with or without some stabilizer, and cooked ice cream, known as French ice cream, in which eggs are used, and sometimes flour or cornstarch. Plain ice cream is usually flavored with vanilla, coffee, chocolate, maple, or fresh or canned fruits. The history of ice cream is only fragmentary. Water ices were probably brought to France from Italy about 1550, and ice cream is said to have been known in Paris in 1775, and in Eng-

land and Germany at about the same time. The first advertisement of ice cream in New York appeared June 8, 1786, and the dish was introduced in Washington by Mrs. Alexander Hamilton at a dinner given in honor of President Jackson. The wholesale ice cream business originated with Jacob Fussell of Baltimore, in 1851, and has been a successful venture from the beginning.

**Iceland**, an island in the North Sea, close to the Arctic Circle. It lies about 500 miles northwest of the Shetland Islands and 250 miles southeast of Greenland, and has an area of nearly 40,000 sq miles, of which probably only 7,000 sq miles are habitable. The northern shores are much indented by fiords, but the southern coast is unbroken by bays or inlets. The surface consists of ice-clad plateaus from 1,500 to 2,000 ft in height. There are numerous lakes, mostly small, many are crater basins and moraine lakes. Glacier fields constitute over 5,000 sq miles of the area and large tracts of the interior are covered with lavas of recent origin. There are many volcanoes, of which at least twenty have been in eruption in modern times. The best known are Hekla, Katla, and Askja. More than seventy earthquakes occurred in the nineteenth century. Hot springs are numerous, and the geysers are famous for their intermittent eruptions of scalding water. The scenery of the island has great natural beauty.

Iceland was discovered and colonized by Norsemen, or Scandinavian Vikings, between 870 and 950, though Irish monks would appear to have visited the island, and settled there, from the year 795 onwards. The earliest immigrants arrived in four main streams—the first and fourth from Norway, the second from the Norse kingdom of Dublin, the third from the Orkneys and Western (i.e. Hebridean) islands. Christianity became established about 1000. At first the Icelanders constituted themselves into a sort of aristocratic republic of franklins whose central authority was the Althing, or national assembly. But internal conflicts led (1262-71) to the island falling under the supremacy of the kings of Norway. From about 1280, though *de jure* only from 1388, Iceland was a dependency of the Danish crown. The restoration of national self-government, though still under the control of the Danish crown, was secured in 1902. In December 1918 Iceland was acknowledged as a sovereign state, united with Denmark only by the identity of the sovereign and by the agreement comprised

in the Act of Union adopted Nov. 30, 1918. The present constitution was adopted in 1920. England occupied Iceland following the German conquest of Denmark in 1940 and in 1941 the U. S. also sent troops there and constructed large naval and air bases, p. 127,770. Cap., Reykjavík.

The language spoken and written in Iceland at the present day is almost precisely the same as that spoken and written at the date of its colonization in the 9th century—the ancient Norraen (Northern) or Danish tongue, which presents close affinities to Anglo-Saxon, and which, the sagas state, was readily understood not only throughout the

embraces the mythical-heroic sagas. The *Elder Edda*, which preserves the ancient mythical songs, was attributed to Sæmund, who flourished about 1100 A.D., a contemporary of Sæmund, wrote chronicles *Kronungabok* and a wonderful Domesday Book of Iceland *Landnamabok*.

The relatively barren stretch between the earlier and the later literary periods can furnish the names of only three poets—Stefan Olafsson, Hallgrímur Petursson, and Eggerl Olafsson. The awakening took place between 1830 and 1880, the most potent organ being the magazine *Fjölur* (1835), to which poems, new both in form and in subject,



Ewing Galloway, N. Y.

Floating Icebergs

Scandinavian countries, but also in England. The language employed in the runic monuments was also closely akin to ancient Icelandic. The literature, like that of Norway, counts two periods of especial fruitfulness—the first from about the middle of the 11th to the end of the 13th century, and the second from the beginning of the 19th century to the present time. The literature of the older period admits of being grouped in three divisions—the ancient mythical and heroic songs, the scaldic poetry, and the sagas. The most valuable of the mythic or mythological songs are the *Voluspa*, or 'Wise Woman's Prophecy', *Hamarsheimt*, or 'Fetching Home the Hammer', *Hymiskvida*, or 'The Song of Hymir', and others.

The prose saga, however, is the peculiar and crowning product of Icelandic genius. Among the host of sagas written in this period the following are perhaps most notable, the *Gylfaginning*, *Volsungasaga*, *Laxdæla*, *Gisli*, *Njal*, and *Gunnlaug*. The chief sources for ancient Icelandic literature are two collections known as the *Elder Edda* and the *Younger Edda*. The latter was put together by Snorri Sturluson (1178-1241) about 1222, and

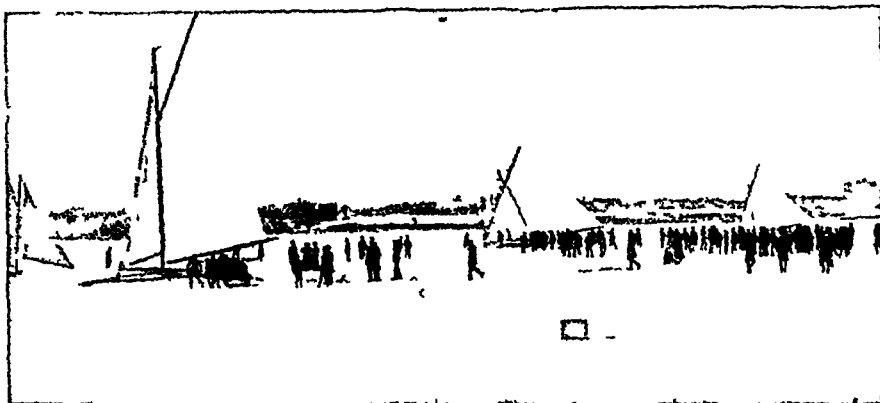
were contributed by Bjarni Thorarensen (1786-1841) and Jonas Halgrimsson (1807-45). The two most distinguished novelists of the 19th century were Jon Thoroddsen (1819-68), whose most popular book, *Piltur og Stulka*, minutely detailed pictures of Icelandic domestic life, and Gestur Pálsson (1852-91). To the early 20th century belong the names Jonas Gudlaugsson, Jakob Thorarensen, Stefan fra Hvítadal, Sigurjon Jonsson, and David Stefanson, all poets whose works have but rarely been translated into English. Among the leading novelists are Einar Hjorleifsson Kvaran, a master of prose fiction, and Gunnar Gunnarsson, the author of *Sworn Brothers* and *Guest the One-Eyed*. Short story writers include Gestur Pálsson, Guðmundur Fridjonsson, and Guðmundur Hagalinre. The playwright Johann Sigurjonsson (1880-1919), who wrote in the Danish language, and Guðmundur Kamban are outstanding Icelandic dramatists. Consult Morris' and Magnusson's *The Saga Library*, Horn's *History of the Literature of the Scandinavian North*, Craigie's *The Icelandic Sagas*, Vigfusson and Powell's *Original Icelandic*. See also *Edda*.

**Iceland Moss**, a lichen found in mountainous regions of Northern Europe and elsewhere. In Iceland the plant is important commercially and is used as a food. It is also used for dressing the warp in weaving and in manufacturing sizing paper.

**Iceland Spar** is a clear, transparent, colorless variety of calcite  $\text{CaCO}_3$ , found in Ice-

covered with glittering protuberant dots. All through the summer it bears white, axillary flowers close to the stems.

**Ice Yachting** is a popular winter sport on inland waters of the United States extending from the Great Lakes to the Atlantic coast. On the frozen rivers, and lakes during the season hundreds of these yachts are to be



*Ice Yachting*

land, sp gr 2.7,  $n = 1.5$ . It is, by reason of its strong double refraction and perfect transparency, pre-eminently suited for optical purposes particularly in polariscopes and Nicol's prisms.



*Iceland Moss*

**Iceni**, an ancient British people, who dwelt in the modern counties of Suffolk and Norfolk. They revolted against the Romans under their queen Boadicea.

**Ice plant**, a procumbent, succulent plant

seen, and they vary from the home-made sleds to the expensive yachts which are capable of nearly a mile a minute. Some carry a spread of canvas which would be sufficient for a racing yacht in deep waters, while others have little more spread than the traditional pocket-handkerchief. Ice yachting began to take definite shape in America about fifty years ago, and the first regular ice yacht club on the Hudson river was formed in 1861, to be followed by similar clubs on the Shrewsbury river in New Jersey, on various lakes throughout the Eastern states, and upon the great and small lakes in the Northwest.



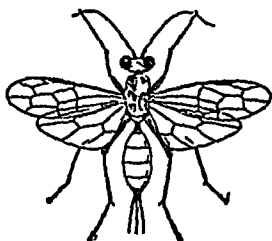
*Ichneumon*

**Ichneumon**, or **Egyptian Mongoose**, an animal of the civet family, found in Africa north of the Great Desert, Southern Spain, Asia Minor, and Palestine.

**Ichneumon-flies** are hymenopterous insects. Several thousand species are known, and there is much variation in size, some



having ovipositors from three to four inches in length, while other forms are exceedingly minute. Examples of the latter are species of *Macrogaster*, which are parasitic upon the caterpillar of the white cabbage butterfly. Ichneumon-flies are usually very slender, long-bodied insects, and otherwise may be distinguished from true flies by the presence of two pairs of wings, no less than by the structure of the mouth.



*Ichneumon-fly*

**Ichnology**, the study of fossil footprints. These are most common in the Permian and Triassic strata, where large slabs of rock are often covered with impressions of the feet of reptiles or amphibians, which walked over the soft sand when it was wet. The most remarkable locality for such footprints is the Connecticut Valley.

**Ichor**, a word used by Homer to signify the ethereal fluid, not blood, which flowed in the veins of the gods of Olympus.

**Ichthyodorulites** are fossil fish-spines, mostly belonging to extinct species of sharks.

**Ichthyol** ( $C_{12}H_{20}S_2O_6[NH_4]_2[?]$ ), a brown, viscous, chemically complex liquid of strong odor and taste, distilled from a fossiliferous deposit found near Seefeld in the Austrian Tyrol. Ichthyol has been used with favorable results in a wide variety of diseases, ranging from affections of the skin, erysipelas, acne, eczema, etc., to neuralgia, catarrh, gout, rheumatism, gonorrhoea, and sciatica, and to pulmonary tuberculosis, smallpox, scarlet fever, diphtheria, and measles.

**Ichthyology**, the science of fishes. See **Fisheries**.

**Ichthyornis**, an extinct toothed bird, which had a row of reptile teeth in each jaw. Its remains have been found in the middle Cretaceous of Kansas, and indicate that it was about a foot in height.

**Ichthyosaurus** (Greek, 'fish-lizard'), a genus of fossil reptiles which much resembled in appearance a fish or a porpoise. In length they ranged from 3 or 4 ft to over 30 ft. A long, pointed head, with jaws armed with rows of formidable teeth, passed directly into

the fusiform body, as the animal had practically no neck, like existing whales. The similarity to whales extends even to minute details of the external form, and this is a remarkable example of convergence between two distinct races, the reptiles and the mammals, as a result of the adaptation to an aquatic mode of life. The animal was apparently carnivorous, and fed on fishes and molluscs. Some members of the genus, at least, were viviparous. Remains of the ichthyosaurus are found in Triassic, Jurassic, and Cretaceous strata in Europe, Australia, Africa, and South America. The only representative so far found in North America is the *Bryonodon*.

**Ichthyosis**, a skin disease in which the surface of the skin is dry, hard, rough, and grayish in color, and its upper layers are shed in scaly fragments. The disease is sometimes congenital and hereditary.

**Ickes, Harold Le Clair** (1874- ), public official, lawyer, was born in Frankstown, Pa., educated at University of Chicago. He became active as a reformer, championing the 'under dog' and attacking Chicago politicians. In 1912-15 was State leader of the Progressive Party, in 1916 supported Charles E. Hughes, managing his campaign for the Presidency, in 1924 managed Hiram Johnson's campaign for Presidential nomination, in 1926 was Independent Republican candidate for Senator from Illinois. In 1933 was appointed by Pres. F. D. Roosevelt as Secretary of the Interior, also oil administrator and administrator of Public Works under the N. R. A. In spite of his contentious nature he was an unusually able executive and a man of honor. For 6 years he supervised the expenditure of over \$5,000,000,000 on public work projects. He resigned as Secretary of Interior, 1946. Among his books is *Autobiography of a Curmudgeon* (1943).

**Iconium** (modern **Konya**), ancient city in Asia Minor, situated on the principal military and commercial highway. Iconium appears to have been an important Christian center, and many ecclesiastical remains of early date have been found. It was three times visited by Paul and Barnabas. A synod of the church was held there in 235 A.D. The Emperor Claudius granted to the city the title of 'Claudiconum,' and Hadrian raised it to the rank of a Roman colony. About 1074 it fell into the hands of the Seljuk Turks, in 1079 was made the capital of their kingdom, and for a time enjoyed great splendor and prosperity. The town played a

prominent part in the Crusades, being occupied by Godfrey of Bouillon, and by Frederick Barbarossa (1190) Here Ibrahim Pasha of Egypt defeated the Turks in 1832 The modern ΚΟΝΙΕΝ manufactures woolen goods, carpets, and leather, and is the seat of a Greek archbishop, p 50,000

#### Iconoclasts See Image Worship

**Ictinus** (c 450 B C), Athenian architect, who flourished during the 'Age of Pericles' With Callicrates he designed the Parthenon at Athens, it was completed in 438 B C Ictinus was also the architect of the beautiful temple of Apollo Epicurius at Bassæ, and of the shrine at Eleusis in which the mysteries were celebrated

**Ida**, a mountain range in Mysia, Asia Minor, scene of the rape of Ganymede and of the judgment of Paris, and (in Homer) the place from which the gods watched the battle between the Trojans and Greeks It was intimately connected with the worship of Cybele It is now known as Kaz Dagh

**Ida**, a mountain in the center of Crete, associated with the worship of Zeus, whose birth was believed to have taken place in a cave there Modern name, *Psiloritti*

**Ida** (d 559), first king of Bernicia, began to reign in Northumbria in 547

**Idaho** (Indian, 'gem of the mountains'), one of the Western States of the United States It ranges in width from 50 m on the northern boundary to nearly 300 m on the southern boundary, has an extreme length of 485 m, and a total area of 84,313 sq m, p 524,873

**Topography**—The surface of the State is rough and mountainous, diversified by fertile river valleys, upland meadows, rolling prairies, broad plateaus, and arid deserts, with many rugged canyons and deep gulches The altitude is generally high, the extremes being 738 ft at Lewiston and 12,078 ft for Hyndman Peak Prominent in the midst of the Snake River Plains are the detached peaks, Three Buttes, famous landmarks for travellers for many years Big Butte is a volcanic cone rising to a height of 7,659 ft above sea level, and nearly 2,500 ft above the plain The southeastern part of the State lies in the Great Salt Lake Basin The remainder is drained by Coeur d'Alene, Kootenai, Clark's Fork, Snake or Shoshone, and Spokane Rivers The Snake with its tributaries drains 60,000 sq m This river is notable for its remarkable falls, particularly the American, Shoshone (200 ft), and Salmon and for its great canyon The available

water power is very great, and many thousand horsepower have been developed, much of which is used in mining operations

There are two lake regions one in the panhandle includes Pend d'Oreille, Coeur d'Alene, and Kamiku lakes, the other in the se includes John Day and Bear lakes The overflow of Bear Lake passes into Great Salt Lake through Bear River These lake regions are perhaps the finest hunting-grounds in the United States Among the wild animals are the grizzly bear, brown bear, black bear, racoon, panther, badger, wolf, fox, and coyote Fur-bearing animals are represented by the lynx, mink, and beaver The bison, once common, is now seldom seen Moose and elk are occasionally met with Deer and antelope are numerous The Rocky Mountain sheep is found in the Coeur d'Alene Mountains The climate is diversified the mountainous portions have severe winters and heavy snowfall, the river valleys have a moderate and equable temperature

**Mining**—Idaho is rich in minerals The value of gold, silver, copper, lead, and zinc produced from the mines annually is about \$40,000,000 Idaho held first place in silver production for the year 1938, a position held by Utah from 1920 to 1932 The forest reserves of Idaho cover 20,761,979 acres and contain about 81,310,000,000 ft of timber A sawmill at Potlatch is said to be the largest producer in the world The growth is mainly coniferous—yellow pine, white pine, red and white fir, and cedar

**Agriculture**—The larger part of the agricultural land is the plateau along the Snake River Excellent crops are produced by the aid of extensive irrigation projects, most of them in the Snake River valley About 1,028,000 acres are under hay, the yield of which averages 2 323,000 tons Other important crops are oats 4 914,000 bushels, wheat, 29,848,000 bushels The early history of Idaho is bound up with that of the States of Oregon and Washington In 1859 gold was discovered in the Pierce City region and by autumn of 1862 there were 30,000 persons near Lewiston The greater discovery in the Boise basin followed, and within a year Idaho City had 40,000 inhabitants Idaho formed part of Washington Territory until March 3, 1863, when it became the Territory of Idaho, with Lewiston as its capital It included Montana (separated in 1864) and Wyoming (separated in 1868) These changes reduced the limits of Idaho to those described in the act of admission to statehood, ap-

proved July 3, 1890 At the census of 1870 only 15,000 remained of the swarm of miners of the early sixties, but \$200,000,000 worth of gold had been taken out of Idaho—the greatest record in history for the same period of time

Serious conflicts with Indians, in which many settlers and soldiers were killed, occurred in 1877-9 In 1880 agriculture received new impetus from the introduction of irrigation The Oregon Short Line Railroad opened up the Snake River valley, and,



Harold L. Ickes

with the discovery of silver-bearing lead in the Coeur d'Alene district, immigration increased In 1889 Idaho adopted a new constitution, and in 1890 was admitted to the Union Labor troubles have been frequent and severe in the Coeur d'Alene district In 1905 Governor Steunenberg was assassinated following his efforts to subdue rioting miners with the aid of Federal troops In 1923 the American Falls project was authorized, to bring 110,000 acres of land under irrigation and stabilize the water supply for 560,000 acres of irrigated land, at a cost of \$8,500,000 In 1924 the North and South Highway was completed, breaking through what was formerly an almost unsurmountable mountain barrier In 1924 the Black Canyon Dam

near Emmett was completed and in 1925 the main line of the Union Pacific to Boise

In 1931 suspicion was aroused that forest fires, prevalent in southern Idaho, had been started by unemployed men, who hoped to procure work as fire fighters Martial law was declared In 1938 Idaho produced 18,601,127 ounces of silver, worth \$12,024,971, p 524,873 Boise, the capital and largest city, p 26,130 See Bancroft's *Washington, Idaho, and Montana*, Hawkes' *Workbook in Idaho History*, Lukens' *Idaho Citizen* (1927), Brosnan's *History of the State of Idaho* (1926), WPA Writers' Project, *Idaho* (1938)

**Idaho Springs**, city, Clear Creek co, Colorado Here was made the first discovery of gold in working quantities in the Rocky Mountains, and the lode mines have been highly productive ever since in gold, silver, lead, and copper Because of its hot springs, a well-known cure for rheumatism, its healthful climate, and mountain scenery, the city is a favorite summer resort There are large ore mills, p 2,112

**Idaho, University of**, a coeducational State institution in Moscow, Idaho, chartered in 1889

**Idalium** (modern *Dali*), ancient town, Cyprus Adjoining it was a temple sacred to the Aphrodite, from which the goddess was sometimes called Idalia Ancient cemeteries, ruins of temple, coins and statues have been found at or near the town In 1868 a bilingual inscription, Phoenician and Cypriote, was discovered, from which the ancient language of Cyprus was first ascertained to be a dialect of Greek

**Idas**, in Greek legend son of Aphareus and Arene and brother of Lynceus Idas figures in the legends of the Calydonian boar hunt, the Argonauts' expedition, and the battle between Castor and Pollux in which Idas slew Castor and was himself slain by a thunderbolt from Zeus

**Iddesleigh**, Stafford Northcote, First earl of (1818-87), English statesman He was one of the commissioners for the settlement of the Alabama Claims (1871) On the return of his party to power (1874), he became Chancellor of the Exchequer, and distinguished himself by the introduction of the sinking fund for the reduction of the national debt On Disraeli's elevation to the peerage (1876), Northcote succeeded him as leader of the Commons He was created Earl of Iddesleigh (1885), and the same year be-

came First Lord of the Treasury In Silsbury's administration (1886) he was Foreign Secretary, but resigned in December of that year He was the author of *A Short Review of the History of the Navigation Laws* (1849), *Twenty Years of Financial Policy* (1862), *Lectures and Essays* (1887)

**Ide, Henry Clay** (1844-1921), American lawyer and diplomat, born in Barnet, Vt He was a member of the Taft Philippine commission in 1900, and served successively as secretary of finance and justice, vice-governor, and governor-general of the Philippines until the end of 1906 In 1909 he was made Envoy Extraordinary and Minister Plenipotentiary to Spain

**Idea** As used by Plato, the term is the metaphysical equivalent for the concept or definition, on whose importance in philosophy his master Socrates laid so much stress in ethics In contrast with the sensible and particular thing of phenomenon, which is apprehended by ordinary perception, the idea is thus supersensible, and belongs to a higher order of reality, an intelligible world, apprehended by thought In modern philosophy the term was used, at first by the Cartesians, and thence onward till the time of Kant, in the psychological sense from which the popular use is derived, and which has remained, with some modification, the prevalent sense of the term in English philosophy Thus Locke, at the outset of his essay, proposes to use it as 'being the term which serves best to stand for whatsoever is the object of the understanding when a man thinks,' or, as we should now say, *the general term for any object of consciousness as such, whether a percept, image, or concept* By Hume, however, the term impression was employed to denote direct perceptions or sensations, and idea was used only for the memory images which may be formed from these, and by means of which thought works And this usage of idea has tended to prevail in scientific psychology as well as in popular language

By Kant the term idea was used to signify the highest concepts of reason—concepts which, though incapable of being verified as realities in experience, on account of the limited and phenomenal nature of the latter, nevertheless regulate our thinking as ideals of unity or completeness In the thought of his great idealistic successors the usage of the term passed over into one which was practically a revival of the original Platonic use Consult Stewart's *Plato Doctrine*

*of Ideas* (1909), Miller's *Psychology of Thinking* (1909)

**Idealism** is a term of very wide, varied, and loose application Popularly it is opposed to materialism in philosophy, and to realism in art and literature, and then signifies a regard for and insistence upon a higher and more spiritual view of the world and of life, in opposition to those who see only the more material side of reality and the baser side of life—those who in science admit only physical existences and causes, and who in art and literature lay great stress upon the lower and coarser elements in human nature Even in philosophy the term is used in a vague and fluctuating fashion, but the main usages are two—a metaphysical and a psychological, corresponding to what may be called the Platonic and the psychological usages of the term *idea* In its metaphysical usage idealism is the term applied to philosophies like those of Plato and Hegel, which maintain the world to be in its most ultimate nature intelligible or spiritual In its psychological or epistemological usage the term is applied to a doctrine like that of Berkeley, which regards the external world as existing only for and in the consciousness of individual percipients, while the opposing doctrine of realism asserts the independence of the external world as regards the percipient subject This latter kind of idealism is sometimes termed *subjective*, and contrasted with the former, which is called *absolute idealism* See ETHICS, MATERIALISM, REALISM, KANT

**Identification**, the act or process of establishing the identity of a person This is usually a simple matter, owing to the fact that practically no two persons are exactly alike in form and feature, but the lapse of time frequently renders difficult the identification of the same person at various periods of life A remarkable instance of mistaken identity is recorded in the Tichborne Case It is chiefly in criminal cases that the question of identification assumes importance A valuable method of criminal identification is by the finger-print system, as finger prints remain the same through all bodily changes, and thus establish the identity of the same person at any period of life

**Identity** A thing is said to be identical in philosophy when it is thought of as an unvarying unit with no internal differences The philosophical question of the meaning of identity has three phases, according as it relates to the logical formula or law of iden-

tity, the metaphysical concept of the identity of a thing, the special psychological form which this concept takes in the case of a conscious being or person, the problem of personal identity

**Ides** See **Calends**

**Idiocy**, a term embracing a group of disorders due to arrest in the development of the brain. This developmental arrest is manifested by abnormalities in the mental, moral, and physical condition of the patient. In the more profound degrees of idiocy the higher mental faculties are altogether absent, the special senses are often defective, and the bodily organs and tissues are generally malformed, ill nourished, and functionally weak. When the mental impairment is but slight, the term *imbecile* is often applied to the patient, but no accurate distinction can be drawn between idiocy and imbecility, the difference being one merely of degree.

Idiocy is often classified as congenital, in which mental defect is manifest at birth, developmental, in which a child of average brain power at birth displays mental insufficiency at a later period, and accidental, in which a child at first of normal development becomes idiotic or imbecile after a traumatism, or after diseases such as tubercular meningitis and epilepsy. The ultimate causes of idiocy often lie in ancestral defects, and parental alcoholism, consanguinity, struma, neurosis, and constitutional debility from various causes are the forerunners of innumerable developmental aberrations in the progeny. After birth the gradual unfolding of the childish mind may be arrested at one of the developmental crises, such as those of the first and the second dentition and that of puberty.

**Idiosyncrasy**, in medicine, implies a constitutional peculiarity whereby an individual reacts to a stimulus in an abnormal or unusual way. Thus, some persons are rendered deaf and giddy by even a minute dose of quinine, others develop skin eruptions after certain foods, or after contact with certain plants like *Primula obconica*. Hay fever is an idiosyncratic hypersensitiveness to certain pollens. The odor from various flowers induces faintness, or sickness, in some individuals, while the sight or smell of certain animals causes similar distress. The more marked manifestations of an idiosyncrasy are found chiefly in persons of neurotic type.

**Ido**, an international language, essentially a modified Esperanto. Its advocates claim for it the following advantages over Esper-

into adaptability to ordinary type, type writers, etc., elementary grammatical structure, based on that of Esperanto, but further simplified, the application of scientific principles of derivation, the increase in the number of living roots through the adoption of words common to several languages, and the abandonment of mechanical forms. The circumstances of the invention and progress of Ido are as follows. At the Paris Exposition of 1900 there was appointed, for the adoption of an international language, a delegation composed of prominent representatives of the English, German, Italian, Scandinavian, and Slavonic languages. After several years of investigation, the delegation appointed (1907) a sub-committee to select an international language, and Ido, proposed by the Marquis de Beaufront, was adopted. Manuals and dictionaries have been issued, 14 Ido periodicals started, *Progreso* being the official organ, and numerous Ido societies founded. The system includes among its advocates Dr. L. Couturat the philologist, Dr. Forster, director of the Berlin Observatory, and Professors Ahlberg of Stockholm, Courtenay of St. Petersburg, Jespersen of Copenhagen, Lorenz of Zurich, and Ostwald of Leipzig.

**Idolatry** (Gr. *eidolon*, 'image,' and *latreia*, 'worship'), the worship of idols or other representations of deity or supernatural beings, the worship of other than the one true God. It was formerly maintained that idolatry was a degenerate form of the true worship, but recent investigation tends to show that it is a stage in the development of religion, and by no means the earliest. Idolatry was an essential element in the cults of Egypt, Greece, and Rome, while it is absent from many less developed religions—as, for example, the Hottentot and the Eskimo. It was widely disseminated in the primitive Semitic world. The graven image and the picture have had their part in the development of the church worship of mediæval and modern Christianity, chiefly as aids to religious contemplation and devotion. The Reformed churches do not permit their use, but the Lutheran still admit of images by way of ornament, or as helpful to devotion.

**Idomeneus**, king of Crete, son of Deucalion, was the captain of the Cretans in the Trojan War. Post-Homeric traditions tell that in a storm he vowed to sacrifice to Poseidon whatever he should first meet on landing. This was his son, whom he accordingly sacrificed.

**Idria**, town, Austrian province of Carniola. It has quicksilver mines, which have been worked since the 16th century, p 17,000

**Idumaea**, the Greek form of Edom found in the Bible

**Idun**, in Norse mythology, the goddess personifying the reviving year, keeper of the golden apples which the gods tasted to renew their youth

**Idyll**, or **Idyl**, a highly wrought narrative poem, generally descriptive of pastoral scenes such as the idylls of Theocritus, Bion, and Moschus. In his *Idylls of the King*, Tennyson uses the word in its original meaning of 'pictures,' 'select representative tableaux,' as distinguished from the formal epic

**Idylls of the King**, 12 poems by Alfred Tennyson. See TENNYSON

**If**, rocky islet in the Gulf of Lyons, France. The fortress Château d'If was built by Francis I in 1529, and was later used as a State prison—Mirabeau and Philippe Egalité being among its more illustrious occupants. Dumas, in his *Count of Monte Cristo*, imprisons his hero in the château

**Ignatiev, Nikolai Pavovitch, Count** (1832-1908), Russian diplomatist, was born in St. Petersburg. At the Peace of Paris he took an active part in the negotiations regarding the rectification of the Russian frontier on the Lower Danube. In 1858 he concluded commercial treaties with the Khan of Khiva. Two years later he was sent as plenipotentiary to Peking, and obtained for Russia the left bank of the Amur, and a large extent of territory. This success led to his appointment as ambassador at Constantinople (1864-77). During these years he steadily endeavored to secure for Russia a powerful influence over Turkey, and especially over the Christian subjects of the Porte. In the negotiations before and after the Russo-Turkish War of 1877-8 he took a prominent part, and the treaty of San Stefano was mainly his work.

**Ignatius**, bishop of Antioch, and one of the so-called 'Apostolic Fathers.' A fairly reliable tradition represents him as having been a pupil of the Apostle John. When persecution broke out suddenly in Antioch in the reign of Trajan, Ignatius was seized and sent to Rome to fight with wild beasts (c. 115 A.D.). On his journey he received several communications from Christian churches, and by way of response wrote his famous Epistles, as also one to his friend Polycarp, bishop of Smyrna. These letters have in modern times been the theme of much contro-

versy, the point in dispute being not only the actual number to be admitted as genuine, but also their form and extent. Consult Moller's *Church History*, Strawley's *Epistles of St. Ignatius* (2 vols., 1900), Genouillac's *L'Eglise Chrétienne au Temps de S. Ignace d'Antioche* (1908).

**Ignatius, Father** (1837-1908)—family name, Joseph Leicester Lyne—English preacher and writer, was born in London. His efforts to restore monasticism in the Church of England led him to purchase land near Abergavenny, where, in 1870, he erected the Llanthony Abbey, of which he became superior. Here the monks use the Benedictine breviary and the Sarum Missal of the ante-Reformation Church of England, and wear the Benedictine dress. In 1890-1 he made a very successful missionary tour through Canada and the United States, and in London his enthusiastic mission preaching attracted great crowds.

**Ignatius' Beans, St.**, are the seeds of *Strychnos Ignatii*, a tree growing in the Philippine Islands and in Cochinchina. They were thus named by the Jesuits after the founder of their order. The seeds are as large as olives, and are contained in a pear-shaped fruit. They are horn-, angular, and very bitter, and contain about 15 per cent of strychnine as their active principle.

**Igneous Rocks**, one of the main groups of rocks comprising all varieties that have solidified from a molten condition. They occur as lavas which have been poured out on the earth's surface, in the form of dikes, sheets, and chimneys extending to unknown depths, and as bosses and great irregular masses that have consolidated below the surface, but may have since been exposed to view by erosion of the overlying rocks. They were probably the first to be formed on cooling of the molten globe, and are to be regarded as the sources from which, by physical and chemical changes, all other rocks have been derived. In appearance the igneous rocks are typically massive, a feature that serves to distinguish them from the sedimentary group, the members of which exhibit stratification, and from the metamorphic group, which is characterized by lamination or schistosity. The mode of aggregation of the constituents, or texture as it is called, in igneous rocks, varies with the circumstances under which they have cooled. The principal varieties of texture are the vitreous, the felsitic, the porphyritic and the granitoid.

The mineral and chemical composition varies within rather wide limits. The important minerals, however, are comparatively few in number, comprising quartz, feldspar, nepheline, leucite, horn-blende, pyroxene, biotite, and olivine. According to the percentage of silica present, which varies from a minimum of about 30 to a maximum of about 80 per cent, the rocks may be grouped roughly into three classes—basic, intermediate, and acid. There are various methods of classifying the igneous rock, though it can scarcely be said that any one is thoroughly satisfactory. The most serviceable method, perhaps, is that commonly adopted by American geologists, which has for its basis the three features of chemical composition, mineral composition and texture. See Kemp's, *Handbook of Rocks* (1904), Rosenbusch, *Mikroskopische Physiographie der Mineralien und Gesteine* (1896), Zirkel's *Lehrbuch der Petrographie* (1894).

**Ignis Fatuus** See Will-o'-the-Wisp

**Ignorance of Law** It is a fundamental principle of law that ignorance of the law will not be accepted as an excuse so as to exempt a man from the consequences of his acts—from punishment for a criminal offence or damages for breach of contract.

**Ignorantines**, a religious fraternity founded at Rheims in 1679, and organized in 1683 by Jean Baptiste de la Salle for the free instruction of poor children. The order is no longer confined to France, but has spread over the world. The brethren are better known as the Brothers of Christian Schools.

**Igorote**, or **Igorot**, is the collective name for a number of related Malayan tribes inhabiting Northern Luzon, Philippine Archipelago, signifying 'mountain people'. They are about 5 ft 4 in in stature, round-headed, with straight, coarse, black hair and brown skin. Their mountain-climbing habits give them peculiarly deformed feet. The culture of rice is the chief occupation. See A. E. Jenks's *The Bontoc Igorot* (1905).

**Iguana**, a genus of lizards remarkable for their large size and herbivorous habits. The common species, *I. tuberculata*, reaches a length of from five to six feet, and lives in trees in South and Central America and the W. Indies. The flesh is greatly esteemed as food.

**Iguanodon** A genus of fossil dinosaurs found in the Jurassic and Cretaceous strata of Europe. It was first described by Mantell and named from its structural resemblance to certain lizards that inhabit the

tropics. The animal ranged from 15 to 30 ft in length, including the tail, which was massive and long. It was a land reptile. Several species are known mostly from the Wealden and Purbeck beds. See Hutchinson's *Extinct Monsters* (1892), Smith Woodward's *Vertebrate Paleontology* (1898), Owen's *Fossil Reptiles* (4 vols 1849-84), Mantell's *Medals of Creation* (1844).



*Iguana*

**Ile-de-France** (1) Ancient prov. of France, which in 1791 was divided to form the department of Seine, the greater part of the departments of Seine-et-Oise, Seine-et-Marne, Oise, and Aisne, and a small portion of Nièvre and Loiret. Its former capital was Paris. (2) Former name for Mauritius.

**Ile du Diable**, one of the group of Iles du Salut, off coast of French Guiana. Here Drevfus was imprisoned (1894-9).

**Ileum**, the lowest part of the small intestine, of which it forms about three-fifths.

**Ilex**, strictly the generic name of the hollies, is also used to indicate the 'evergreen' or 'holm' oak, the *ilex* of Latin authors. This is a native of S. Europe.

**Iliad** See Homer and Epic.

**Ilion**, vil., Herkimer co., N. Y. The Remington arms and typewriters are made here. Other manufactures are agricultural implements, sewing-machines, bicycles, p. 8,927.

**Ilissus**, small river in Attica, Greece, which rises in Mt. Hymettus, and flows past Athens on the s.e., falling into the Cephissus two or three m. to the s.w. of the city. It is dry in summer.

**Ilithyia**, in Greek mythology, the goddess who presided over childbirth. She was the daughter of Hera, the goddess of marriage, and though the divine midwife, was herself a virgin deity.

**Ilkley**, urban district, England, in West Riding, Yorkshire. It is n. of Rumble's or Rumbald's Moor, on which rise the mineral

springs for which Ilkley is famous Ilkley is thought to be the old British town *Ohcana*, mentioned by Ptolemy, p 9,105

**Illegitimacy**, the condition of being contrary to law, specifically, the status of children born of unmarried parents The causes which govern the rate of illegitimacy among the peoples of various countries, races, or religions, are exceedingly difficult to determine In European countries the following are generally considered as of importance a toleration of premarital sex relations, marriage laws that result in common-law marriages, the marriage customs of various races and peoples, the large number of late marriages, legislation and legal impediments to marriage In the United States illegitimacy is in general due to ignorance and low ideals Mental defectiveness is probably the most important single cause

Illegitimacy is less common in the United States than in most of Europe or in the remainder of the civilized world, though our knowledge of its extent is incomplete, depending, as it does, almost entirely upon birth registration, which is still grossly inadequate Massachusetts was the earliest of the States to gather statistics on illegitimacy, its first figures being reported in 1854

**Illicium**, a genus of shrubs of the magnolia family which includes the Chinese star anise The flowers are large and showy, with many petals, of a yellowish or purplish hue The odor is aromatic, somewhat anise-like or clove-like, and the fruits are used as a carminative, etc., in medicine

**Illimani**, mountain, Bolivian Andes, Cordillera Real It is one of the highest mountains of the range, its principal peak having an altitude of 21,200 ft It is perpetually covered with snow Its highest point was reached by Sir William M Conway in 1898

**Illington**, Margaret (1881-1934), American actress, was born in Bloomington, Ill She played with E H Sothern in *If I Were King*, and in 1904 appeared as Henriette in an all-star cast of *The Two Orphans* Other successful appearances include Mrs Leffingwell in *Mrs Leffingwell's Boots* (1905), Shirley Roosevelt in *The Lion and the Mouse* (1906), Mary Turner in *Within the Law* (1914), Ruth Brant in *A Good Bad Woman* (1919)

**Illium** (symbol *Il*), an element of the rare earth series having the atomic number 61 and occupying the space in the periodic system between neodymium and samarium It was discovered in 1926 by B S Hopkins

and J A Harris of the University of Illinois using the x-ray methods of Moseley It is the only element discovered by an American and it derives its name from an American State

**Illinois**, from the Indian word *Illini*, men, popularly known as the 'Prairie State', one of the North Central States of the United States It has an area of 56,665 sq m, of which 622 sq m are water The extreme length is 385 m and the extreme width 218 m The State lies in the valley of the Mississippi River and the basin of the Great Lakes It is in the prairie region of the Middle West, is generally level, with an undulating surface, and slopes gently toward the s and sw

The drainage is mostly to the sw into the Mississippi River, though there are considerable streams flowing s and se into the Ohio and Wabash, and some flow into Lake Michigan Owing to the great length of the State (nearly 400 m) and the higher altitude (over 1,000 ft) of the northern part the average temperatures in the n and the s differ considerably The mean annual temperature at Chicago is 24° F in January and 72° in July, and at Cairo 34° in January and 79° in July, the extremes of temperature recorded being 104° for summer, and -10 for winter

The principal mineral products of Illinois are coal, clay, cement, sand and gravel, natural gas In 1939 Illinois ranked third in the coal output Coal mined in that year was 46,450,000 net tons The coal-yielding area of the State forms a part of the Eastern Interior Coal Field, which, covering an area of approximately 35,000 sq m in Illinois, extends also into Indiana and Kentucky Fluorspar is obtained solely in Hardin co, where are located the world's largest deposits of this mineral The quarrying industries, well distributed throughout the State, furnish stone for construction work, limestone for various other purposes, and sandstone, from which is derived a large part of the silica supply of the United States

The greatest source of wealth, next to manufacturing, is agriculture For about fifty years Illinois has almost continuously held high rank as a producer of corn The annual acreage of corn is 8,430,000 acres, with a yield of 379,350,000 bushels, at an estimated value of \$185,882,000 Illinois is one of the leading manufacturing States w of the Alleghenies In addition to ample railway facilities, the State has the advantages of cheap water transportation afforded by the Mis-



Mississippi and its navigable tributaries and by the Great Lakes

By far the most important industry is slaughtering and meat packing. This industry is almost entirely centered at Chicago. Output of foundries and manufacture of electrical machinery are also important. The Illinois petroleum field is being rapidly developed, many new wells have been put down since 1936, Illinois oil wells produced 94,302,000 barrels in 1939. Other leading industries include printing and publishing, women's and men's clothing, agricultural implements, iron and steel works, rolling mills, railroad cars, flour-mills, bread and bakery products, lumber and timber, furniture and refrigerators, tobacco manufactures, paints and varnishes, confectionery, coffee roasting, and spices.

A large fleet of steamers ply on the Great Lakes between their numerous ports, carrying an enormous tonnage annually. The water transportation is afforded chiefly by the Mississippi River on the w, the Ohio River on the s, and Lake Michigan on the n e. The Lake trade is very extensive. Chicago, the only port of entry, is one of the leading Lake ports. The Illinois River is connected with the Lake by means of the Illinois and Michigan Canal, the westerly end of which is at La Salle, at the head of navigation on the Illinois River. The Hennepin Canal, recently opened, connects the Illinois River with the Mississippi in the northwestern part of the State. In 1940 there were 59 cities, towns and villages in Illinois which had a population of 10,000 or more. Chicago, the largest city in the State and the second largest in the United States, had a population of 3,396,808, which represented an increase of 20,370, or 06 per cent over 1930. The third and present constitution was adopted in 1870.

The executive department consists of a Governor, Lieutenant-Governor, Secretary of State, Auditor, Superintendent of Public Instruction, an Attorney-General (4 years) and a Treasurer. Under the Federal Reapportionment Act, Illinois has 26 Representatives in the National Congress. Springfield is the State capital. The early events of Illinois history are the explorations by the French. In 1671 La Salle crossed the portage from the Chicago to the Illinois Rivers. The same trip was made several times, and the Illinois and Mississippi Rivers navigated between 1673 and 1675 by Louis Joliet and Father Marquette, who later founded a mission for the Indians on the Illinois River. In 1680-81 La Salle fortified a camp near the present site of

Peoria, which he called Fort Crèvecoeur, and organized the native Indians in resistance against invading Iroquois.

About 1700 two settlements were formed by Indians, wandering traders, and missionaries—one at Kaskaskia, the other at Cahokia. In 1717 these settlements were annexed to the new province of Louisiana, as the District of Illinois. In 1720 Fort Chartres and three new villages were established by the French, and the district was put under the government of a French military commandant and a civil judge. By the Treaty of Paris (1763) the territory was ceded to the English, who were unable to gain possession until the treaty with the Indian chief Pontiac two years later. The Illinois country in 1774 became a part of the province of Quebec. It was formally ceded to the United States in 1783, largely because of an expedition of Virginians under George R. Clark in 1778-79, which resulted in the virtual conquest of the 'Illinois Country'.

After the Ordinance of 1787 it formed a part of the Northwest Territory—Virginia, Massachusetts, and Connecticut having ceded their claims to the United States. The present confines of Illinois formed a part of Indiana Territory from 1800 to 1809, when it was organized as the Territory of Illinois, the seat of government being at Kaskaskia. The first Territorial legislature convened in 1812, and the State was organized and admitted to the Union in 1818. In its early history the Territory experienced tedious and serious Indian troubles, culminating in the historic massacre of Fort Dearborn. In 1839-40 the Mormons, driven out of Missouri, settled at Nauvoo. Financial, political, and social causes led to intense hatred and open warfare, culminating in the assassination of Joseph Smith and his brother Hyrum at Carthage, Ill., in 1844. Then began the remarkable exodus of the Saints, under the leadership of Brigham Young, across the western wilderness to Utah.

A new constitution was adopted in 1848, prohibiting slavery, and establishing the township as the unit of local government. The contest between Stephen A. Douglas and Abraham Lincoln for the U. S. Senatorship in 1858 was an event of national significance. Illinois was a principal source of both men and supplies during the Civil War, sending 214,133 soldiers into the field. After the war, industrial development was rapid. Chicago, favored by a rich agricultural environment and unusual transportation facilities, became

the leading stock and grain market of the country, and mining also developed rapidly. The political movement of 1870 '85, furthered by the Society of Patrons of Industry, led to the imposition of legislative restrictions on corporations generally, and on railroads and trusts in particular—these provisions being made part of a new constitution.

In October 1871, occurred the great Chicago Fire. Railroad riots at Chicago in July, 1877, led to the calling out of the militia and Federal troops, and the labor troubles of 1885 culminated in the Haymarket Riots of May in the latter year. In 1893 was held at Chicago the World's Columbian Exposition. The following year occurred a widespread railroad strike, resulting in the destruction of \$1,000,000 worth of property, and necessitating a call for the militia and United States troops. A memorable coal miners' strike in Central Illinois came in the same year. In 1909 the contest for U. S. Senator, lasting over four months, resulted in the election of William Lorimer. Charges of bribery led to an investigation by the Committee of Election of the U. S. Senate. In State politics Illinois has been mostly Republican since 1857. In national politics it has been Republican since 1860, except in 1892, 1912, 1931, and 1936, when it was Democratic.

Governor Small in 1925 was directed by the Supreme Court of Illinois to account for \$1,000,000 interest money, which he was declared to have withheld while State Treasurer. Gang warfare in 1927 flared severely, no fewer than 60 deaths were reported in five years throughout Southern Illinois. The State Tax Commission in 1927 ordered all real property in Cook co. to be reassessed. A bill to grant the city manager form of government to municipalities was defeated (1929). A Crime Survey committee reported in 1929 that all the legal, penal and police machinery was 'inefficient'. In 1930 the Supreme Court held that the right to trial by jury may be waived in felony cases to relieve the pressure upon the courts, p. 7,897-241.

The Federal Government's prosecution of Al Capone as an income tax violator, which sent the gang leader to the federal penitentiary for a long term, finally broke the back of the criminal ring in Chicago. The State Appellate Court held, 1938, that the National Labor Relations Act could not supersede the State's power to maintain order and that an employer's refusal to bargain with strikers could not justify seizure of his property. See

WPA Writers' Project, *Illinois* (1939).

**Illinois**, North American Indians, an extinct branch of the Algonquin family, whose name, Illinois, 'men', in its French form, survives in the State and river of Illinois. Reduced by the fierce wars waged against them—especially by the Lake Indians in revenge for the murder of Pontiac (1769)—they numbered only 150 in 1800. They have since disappeared as a distinct tribe, having consolidated with the Win and Peoria tribes Indians in Oklahoma.

**Illinois College**, a coeducational institution at Jacksonville, Ill., under Presbyterian auspices founded in 1859.

**Illinois River** is formed by the merging of the Des Plaines and Kankakee Rivers in Grundy co. Illinois. It flows w., s., and s.w. to its confluence with the Mississippi River, 18 m. above Alton. The Fox and Sangamon Rivers are its chief tributaries, Peoria, Ottawa, La Salle, and Pekin are the principal towns along its banks. Total length, 500 m., and its drainage basin, 9,000 sq. m. The Illinois would form a link in the projected 'Lakes to Gulf' deep waterway. A decision of the Supreme Court of the United States in 1919 forbade the diversion of water from Lake Michigan into this river.

**Illinois State Normal University**, the oldest institution for the education of teachers in the Mississippi Valley, was founded at Normal, Ill., in 1857.

**Illinois, University of**, a coeducational State institution, located at Urbana-Champaign, Ill., incorporated in 1867 as the Illinois Industrial University, the present title having been adopted in 1885. The institution is well equipped with laboratories and collections representing the industries and resources of the State. The value of the buildings, plant and college grounds in 1929-30 was \$25,117,354. The total income for the same period was \$6,927,255. The institution is supported by the income of the Morrill land grant of 1862, and by Congressional and State appropriations. Women were first admitted in 1870. Consult Slosson's *Great American Universities* (1909), A Nevins' *History of the University of Illinois*.

**Illinois Wesleyan University**, a coeducational institution under Methodist control at Bloomington, Ill., founded in 1850.

**Illiteracy** may be defined as inability to read or write. The percentage of the population who are illiterate is taken as a measure of the education of any nation, race, or other population group. Methods used in

different countries in the compilation of data relative to illiteracy are so varied that any comparison between countries is only approximate. Thus, in some countries the number of men and women who cannot sign the marriage register is made the basis of calculation, in others, the reading ability of army recruits is the basis, while in a few countries an actual census is taken. In most countries elementary education is compulsory, and the general tendency is toward an increase in the number of years during which a child shall be required to attend school, while the minimum age at which children may be employed in nearly all countries where education is compulsory is being raised correspondingly. The decrease in illiteracy in any one country indicates the progress of education in that country.

Russia presents an interesting example of a decline in illiteracy. The census of 1897 revealed that in the whole Empire 706 per 1,000 males and 869 per 1,000 females over nine years of age were illiterate. The 1920 census showed that for every 1,000 males in the Soviet Union 617 were literate, the proportion of women who could read was 336 per 1,000, while the average per 1,000 for the whole population was 465 literate persons. The census taken in December 1926 in the cities of the Soviet Union showed encouraging results of the educational efforts made by the government. According to the *Soviet Union Year Book 1930*, 'for every 1,000 males 758 were literate, while for women the figures were 626 for every 1,000. In the villages the figures were, naturally, less favorable, being 524 per 1,000 males and 274 per 1,000 women. For the whole Union the average number per 1,000 of the total population who could read was 567.'

U S Census defines as illiterate any person 10 years of age or over who is unable to read and write. According to the 1930 Census figures (issued July 1, 1931), 4.3 per cent of the population 10 years of age and over was returned as illiterate. The percentage of illiteracy in 1920, in the previous Census, computed on the same basis, was 6.0 per cent, in 1910, 7.7, in 1900, 10.7, in 1890, 13.3, in 1880, 17.0, in 1870, 20.0. The number of persons 10 years old and over returned as illiterate in 1930 was 4,283,749, which represents a decrease of 648,156 during the past ten years, the number of illiterates returned in 1920 being 4,931,905. In the United States the problem of illiteracy is not, as many think, a problem of the South and the for-

eign-born alone. New York has the greatest number of illiterates of any State, and 62 per cent of the illiterates listed in the 1920 census were native-born. In general, however, those States having a large rural population contain the greatest number of illiterates. Of the 5,817,862 persons of ten years or over in New York City in 1930, 264,606 were illiterate. Those in Brooklyn numbered 110,323 in 1930, of whom 103,932 were foreign-born whites. Richmond Borough had the smallest number—4,165.

At the time of World War I, of 1,552,256 army men between the ages of twenty-one and thirty-one, 24.9 per cent were found to be illiterate. It was estimated in 1941 that the U S population over 10 years of age was 97 per cent literate. See ADULT EDUCATION, AMERICANIZATION, EVENING SCHOOLS, NEGRO EDUCATION, RURAL SCHOOLS. Consult *Reports of the U S Commissioner-General of Immigration*, Huebner's *Statistical Tables*, U S Census Reports.

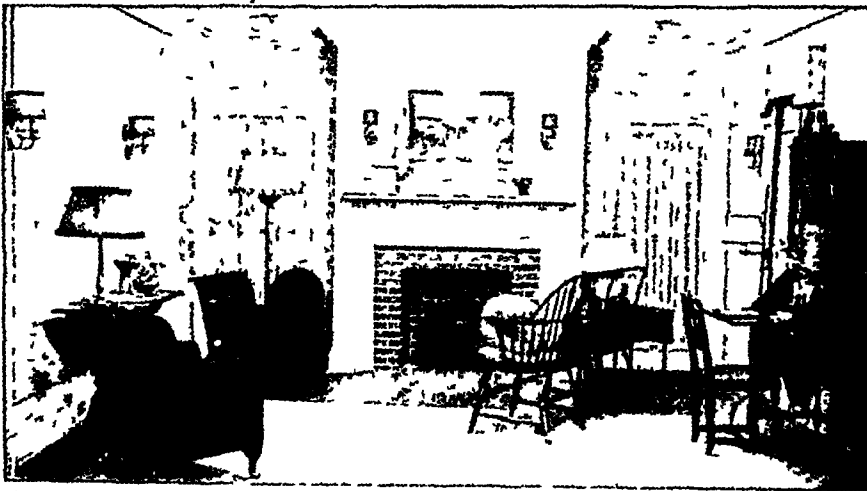
**Illuminati** (Latin, 'the enlightened'), a name assumed by or conferred upon various mystics professing to have special knowledge of God. The sects which may be included under the title are the *Alombrados*, originated in Spain about 1520, and finally crushed by the Inquisition, the *Guertnets* in France, from 1623 to 1635, another sect in the South of France about 1722, which perished in the Revolution, and an association of mystics in Belgium, in the latter half of the 18th century. The name is more particularly given to the Order of the Illuminati, which was founded at Ingolstadt on May 1, 1776, and rapidly spread over Catholic Germany. Its founder, Adam Weishaupt (1748-1830), professor of canon law at Ingolstadt, called it the Order of the Perfectibilists. It was regarded with favor by Goethe, Herder, Nicolai, Ernest II of Gotha, and Karl August of Weimar. By right, the name *Illuminati* belongs to the Mystics and the practitioners of Quietism. Some societies still exist which claim the title of Illuminati, but, strictly speaking, it should be applied only to Weishaupt's organization.

**Illumination** Adequate and appropriate illumination is an aid to comfort and physical well-being, increases industrial production without increase of effort—often with a reduction of effort—and has come to have an important artistic value in the home, in places of public assembly, and particularly on the theatrical stage. The development of the electric light, making available new and

powerful sources, readily controllable not only as to ease of turning on and off, but as to direction, intensity, diffusion, and color, has led to widespread interest and extensive researches regarding the whole field of lighting, including both artificial and natural illumination. Many principles revealed by a study of the former have been applied to the latter. Except for earlier isolated physical measurements, chiefly on the intensity of light sources, this entire field of research and practice is new, practically all the work having been done since 1900. As a branch of professional activity, its recognition may be dated from the founding of the Illuminating Engineering Society in 1906. More than most

most natural ones. A study of natural lighting shows a few guiding ideas as to direction, diffusion, color, and amount. As the eye is accustomed to light falling on nearer objects obliquely from above, artificial light should likewise fall on objects obliquely from above. Special lamps for reading or writing should be placed far enough back of the user that the direct reflection is at a distance from his eyes. The old rule of having the light come obliquely over the left shoulder is a good one.

A great deal of diffusion is desirable. Shades and globes can be made to conform to the general lines of a fixture, or to become a part of the design, without loss of a good



Courtesy General Electric Co

*Illumination Living Room (semi-indirect lighting)*

other engineering branches, however, in addition to physical sciences it touches also on the domains of psychology, physiology, and aesthetics.

Lighting, or illumination, may be generally classed as either useful or decorative. As extreme examples, we may cite the lighting of a workshop, and the special effects in a modern theatre. With the development of new and more efficient light sources has come a greater interest in hygienic and artistic illumination. Poor artificial lighting is still widespread, however, though much of it could be removed, or at least improved, if one basic principle were followed—the use of daylight effects. The human eye has for ages become accustomed to sunlight, so that the best arrangements of artificial sources will be the

diffusion and distribution of light. Lamps should preferably give light resembling sunlight. On account of the great accommodative powers of the eye, with fair vision the intensity of illumination may vary within wide limits. The finer the details that are to be distinguished, the greater will need to be the intensity of illumination. The common unit of illumination is the *foot-candle*, the intensity of illumination of a surface one foot distant from a source of one candle-power and perpendicular to its rays. The illumination varies directly with the intensity of the source and inversely as the square of the distance, a source of 100 candles 5 ft away gives an illumination of 4 foot-candles. (See PHOTOMETRY.)

The unit for total light received by a sur

face is the *lumen*, defined as the amount of light falling on an area of one square foot, to give it an illumination of one foot-candle. The total incident light flux on a surface, in lumens, equals the average intensity in foot-candles multiplied by the area in square feet. The same unit serves also to indicate the light given out by a lamp, it has superseded the older term 'mean spherical candle-power,' and is now used exclusively, in the United States, for expressing the output of incandescent lamps. This makes possible a relatively simple method for planning illumination.

Factors have been worked out giving the percentage of light reaching the working plane under various conditions. This varies within wide limits, depending on the type of shade or reflector, the dimensions of the room, and the color of walls and ceilings. The lighting of a schoolroom may be taken as an example. Assuming lamps with opal enclosing glass-ware and average conditions, the factor is about 30 per cent. Desirable intensity is 8 foot-candles. If the room has an area of 750 sq ft, the total useful light must be  $750 \times 8 = 6,000$  lumens. Since only 30 per cent of the light is useful, in the sense of reaching the working plane, the lamps must give 20,000 lumens. Using 4 lamps, to give reasonably uniform illumination, requires each to have an output of 5,000 lumens. This is approximately the output of a 300-watt lamp. Four such lamps would serve. In a number of States lighting codes have been officially adopted, governing the illumination required in schools and industrial establishments.

**Illumination of Manuscripts**, an art of great antiquity, first exemplified in Egyptian papyri. Roman authors speak of classical works similarly adorned, but none earlier than the Vienna *Dioscorides* and the Vatican *Virgin* of the 4th century remain. The chief styles of illumination are (1) The Byzantine, which is characterized by magnificent execution and the lavish use of gold backgrounds, (2) The Irish, consists mainly of spirals, plates, and interlacings of grotesque monsters, (3) Carolingian, which is marked by splendor of coloring, harmonious design, and the gigantic initials containing miniature pictures, (4) The Opus Anglicum, which is characterized by a peculiar 'fluttering outline', (5) After 1000 the art was helped by Greek artists who migrated from Constantinople. Gold leaf was laid on an impasto of fine plaster and brilliantly burnished. Skill

in drawing increased rapidly, and toward the 14th century foliage and other natural objects became the principal motifs. Initials decreased in size, gaining in perfection. With the Renaissance came decline, though the *Book of Hours* of Anne of Brittany, executed by Jean Bourdichon (end of 15th century), is a priceless treasure. The invention of printing put an end to this beautiful art. Consult Bradley's *Manual of Illumination*, Shaw's *Art of Illumination*, Middleton's *Illuminated Manuscript*.



*Illumination of Manuscripts*

Heading to "St John" from the Lindesfarne Gospels, 700-720 A.D.

#### **Illuminations** See **Pyrotechnics**

**Illusion**, in psychology, is a perception which fails to reveal the true character of the object perceived. The terms illusion and hallucination are often confused, but they are clearly differentiated. An hallucination has no accompanying peripherally initiated impulse, an illusion has such an impulse but it is carried to the wrong brain center. In other words, in an hallucination we see something when there is nothing to see, in an illusion there is something to see but we see the wrong thing. Consult Parish's *Hallucinations and Illusions*, Sully's *Illusions*, Baldwin's *Handbook of Psychology*.

**Illustration of Books**. Since man first discovered how to convey his thoughts to

others by means of writing, he seems to have felt the want of some method of illustration or embellishment. From the Egyptian papyrus down to the invention of printing this was supplied by pictures, colored or uncolored, engravings, carvings, etc., executed by hand. The earliest printed book illustrations which appeared about the second quarter of the 15th century, are the 'block books,' in which text and illustrations were cut in the same block of wood. After the invention of movable types in 1454, wood engraving became almost the only form of book illustration, culminating in Germany in the works of Dürer and Holbein.

The invention of the art of lithography in 1798 gave a great impetus to the production of illustrated books, notable for their cheapness. Simultaneously there was the cultivation of the expensive art of steel engraving. The labor of the illustrator has been much facilitated by the direct photography of the design upon a block of wood, upon which it had formerly been drawn. This, however, ultimately led to the invention of the so-called process work, in which the original is mechanically reproduced upon metal plates. At the present time the photogravure is frequently used, and the half-tone has become the most popular form of illustration. The earliest illustrative work that can properly be called American was that of Alexander Anderson, born 1775. The art in the United States was greatly promoted by the custom of elaborate gift books in the decades preceding 1850, and of even greater importance were the magazine illustrations, beginning with Harper's in 1855. The Civil War interrupted the development of magazine and book illustration, but after its close there arose a school of wood engravers who rendered high technical perfection effects belonging properly to painting, etching, chalk drawing, etc. Printing of elaborately illustrated subscription books, like *Picturesque America*, began in the early seventies, and the influence of the cartoon in the hands of men like Thomas Nast also falls into this period. In no department has progress been more marked than in attractive book illustration, such as the historical subjects of Edwin A. Abbey, perhaps the most accomplished pen draughtsman among American artists, Howard Pyle's drawings of the Revolutionary soldier, and Remington's of his present day successor, and the architectural subjects of Joseph Pennell. The appearance of the *New York Life* offered an opportunity for the amusing illus-

tration of social happenings and the follies, in which field Charles Dana Gibson stands pre-eminent. In recent years the use of woodcuts has been extended—Rockwell Kent has attracted much favor in this field. See Linton's *Masters of Wood Engraving* (1889), Pennell's *Modern Illustration* (1895), Crane's *Decorative Illustration of Books* (1896).

**Illyria**, or **Illyricum**, anciently the mountainous part of the Balkan Peninsula which lay alongside the Adriatic. The inhabitants, a rude and pastoral people, managed to extend their power over Macedonia early in the 4th century B.C., but were overcome by Alexander the Great, and Philip III. Pyrrhus, king of Epirus, seized a part of their territory, and in 228 B.C., their queen Teuta was compelled to yield a strip of the coast lands to Rome. During the next two centuries the Illyrians made repeated attempts to shake off the Roman yoke, but unsuccessfully, and in 35 B.C. Illyria was definitely made a Roman province. Although at first included in the Western empire, Illyria passed in 476 to the Byzantine empire. The country was for the most part subject to the rule of Hungary, Venice, and Byzantium, until it was finally captured by the Turks in the 14th century. In the 17th and 18th centuries the name Illyrians was used to indicate the Slavs who belonged to the Orthodox Greek Church. Napoleon created the Illyrian provinces in 1809, and in 1816 Austria formed the kingdom of Illyria, which embraced Carniola, Carinthia, Istria, and other territories.

**Ilmenite**, **Menaccanite**, or **Titaniferous Iron Oxide**,  $\text{Fe O}$ ,  $\text{Ti O}$ , is a common rock forming mineral, chiefly found in small black, hexagonal crystals, often plate-like and somewhat resembling those of hematite. The luster of ilmenite is sub-metallic and its hardness between 5 and 6. The large amount of fuel required to reduce this mineral renders it, in most cases, undesirable as an ore of iron, although deposits at Arendal and Tvedestrand, Norway, are used for iron ore. It is, however, used as a lining for puddling furnaces.

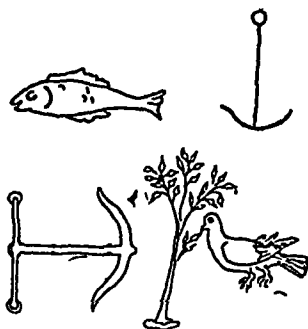
**Ilocos, Sur**, prov., Luzon, Philippines, s. of Ilocos Norte, on the narrow coastal plain. The province is fertile and produces rice, corn, indigo, sugar, vegetables, and peanuts. Weaving is the chief industry, p 192,000.

**Iloilo** Prov., Panay, Philippines, occupies the s.e. coast of the island on the Visayan Sea, the Strait of Iloilo and the Mindoro Sea. The land is exceedingly fertile, and the

climate, with proper precautions, is healthful. The coast has several harbors, among them the Iloilo R., navigable for vessels of 15 ft draft. It is the second most populous province of the archipelago. Gold is washed at San Enrique and Barotoc Viejo, and petroleum and natural gas are found at Januay, but the main resources of the country are agricultural. The forests contain valuable woods. The inhabitants are mainly Bisayas and half-breeds. They manufacture cloth of pineapple fiber, called piña, cotton, sinamay, jusi, etc., as well as sugar, p 420,000.

**Ilus**, a Trojan hero, son of Tros and Calirhoe, and grandfather of Priam, was held to be the founder of Ilion or Troy.

**Image-worship** Images were not introduced into the churches of the primitive Christians, nor pictures, except in the form of symbols, such as the dove, the palm branch, the anchor, fish, etc. So long as the church was engaged in mortal struggle with heathenism there was a strong feeling against images, as savoring of idolatry. It was not until the end of the 4th century that pictures



*Early Christian Symbols*

of saints and martyrs were set up in churches. The sixth General Council, held at Constantinople in 692, enjoined that Christ should no longer be depicted merely under symbol of the Lamb, but shall be represented as a Man. The second Council of Nice, in 787, sanctioned images of God the Father, the Holy Trinity, etc., in all the churches. The habit of using images as helps to devotion grew rapidly, candles and incense, etc., were freely offered to them. This worship of images was the subject of heated controversy in the early church. The modern use of the Greek Church permits ikons, or pictures, but disallows graven images. The Roman Catholic Church strongly supports the use of images.

**Imago**, the name given to the adult sexual insect. Thus the butterfly is the imago

of the insect whose larval stage is the caterpillar. See **INSECTS**.

**Imam**, or **Imaum**, the guide who, in Mohammedan worship, recites and leads the prayers of the faithful.

**Imantophyllum**, a genus of bulbous plants belonging to the order Amaryllidaceae.

**Imbecility** See **Idiocy**.

**Imitation**, as a term in music, is applied to a kind of contrapuntal device much used in certain forms of musical composition. It frequently consists of two or more parts, replicas of each other, at the same or some other pitch, or differing but slightly in interval and time value of notes. Among other methods of imitation are those caused by inversion, reversion, augmentation, and diminution. See **CANON**, **COUNTERPOINT**, **FUGUE**.

**Immaculate Conception** (1) The dogma of the Roman Catholic Church that the Virgin Mary was without sin from her conception. (2) The festival in honor of the supposed fact, celebrated Dec 8. It naturally followed the acknowledgment of the Virgin Mary as 'Mother of God.' The immaculate conception was a subject of prolonged controversy. In spite of the general acceptance of the doctrine, it was not exalted into an article of faith until Dec 8, 1854, when Pope Pius IX published the bull 'Ineffabilis Deus,' declaring 'that the Blessed Virgin Mary at the first instant of her conception, by a singular privilege and grace of the omnipotent God, in virtue of the merits of Jesus Christ, the Saviour of mankind, was preserved immaculate from all stain of original sin.'

**Immanence**, **Immanent** The philosophical term 'immanent' has two chief meanings or applications. (1) As contrasted with 'transcendent' for example, is God's nature completely expressed in His activity within the world of nature and history, in maintaining it and ordering its course, or has He a life of His own, so to speak, apart from the universe? (See **PANTHEISM** and **DEISM**.) Some theologians consider divine immanence and transcendence to be complementary, when properly defined. (2) 'Immanent' is contrasted with 'transeunt.' Activity or causality, the effects of which remain within the agent, is said to be immanent, whereas that which, going beyond the agent, produces effects in other things, is said to be transeunt.

**Immanuel**, or **Emmanuel**, the name of the child whose birth and experiences were to be a divine sign to Ahaz, king of Judah, during the war with Syria and Ephraim. Con-

siderable diversity of opinion prevail with regard to the exact significance of the prophecy.

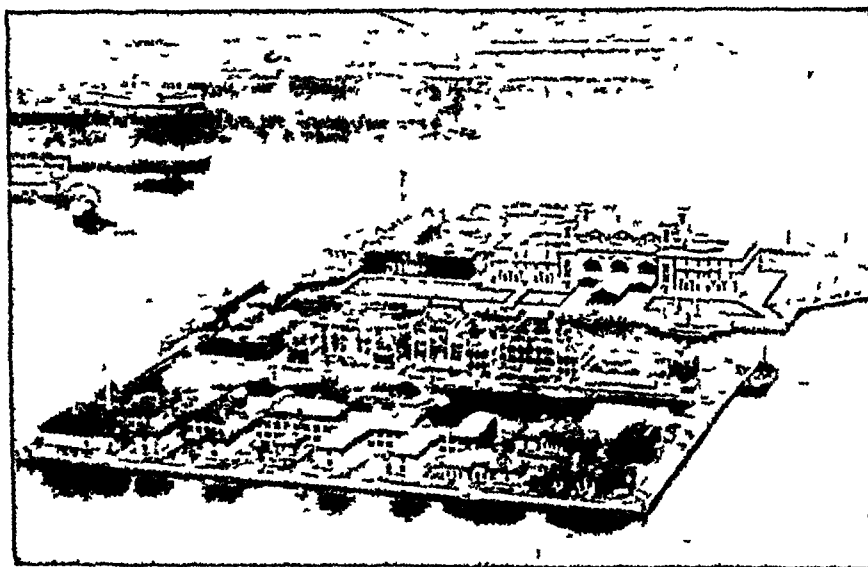
**Immer Goose**, familiarly known as the Loon, a large aquatic bird found in the northern part of the northern hemisphere. It is somewhat larger than a duck, blackish or slate-colored above and white beneath.

**Immersion** See Baptism

**Immigration** Migration is the movement of people from place to place, with the intention of changing their residence or domicile. The movement has been manifold, from country to city, from mother country to colony, and from one country to another. From

For many years, immigrants came to America in large numbers signed up for specific jobs under contract. This form of immigration, however, was ultimately legislated out of business by the Contract Labor Law. Immigration has also been materially stimulated in the past by the propaganda conducted by steamship ticket agents in some of the leading European ports, in spite of the fact that such propaganda is forbidden by both the United States and European countries. The changes brought about by the immigration restriction law have resulted in a discontinuance of this practice.

To these economic causes of immigration



Keystone View Co., N. Y.

*Ellis Island U. S. Immigration Station*

the point of view of the city or country entered it is known as immigration, from the point of view of the place left as emigration. Migration in the larger sense has characterized every civilization and clime. The prime cause for immigration, especially the immigration of the present day, is economic. In the case of the United States there has been a direct relation between good times and the volume of immigration. After periods of severe business depression the number of immigrants has fallen and the number of emigrants leaving the United States has increased. So also, bad times in Europe have been followed by increased waves of emigration to the United States, Cuba, and elsewhere.

may be added a number of others less widespread in their operation: the spirit of unrest and adventure which has influenced a small minority in every group, the desire to escape military service, which in the past acted as an incentive to emigration from such countries as Russia, Austria-Hungary, and Prussia, and political or religious conditions, which have had their influence from the coming of the Pilgrims of the *Mayflower*, and the Mennonites of the *Concord*, and which still bring to America considerable numbers of Armenians, Hebrews, and others. Among the secondary causes of emigration are the advice and assistance of relatives and friends who have previously emigrated. Thus Amer-



ica has attracted large numbers of immigrants as the land of opportunity. Owing to the widespread poverty and suffering in Central and Eastern Europe after World War I and II, the number of persons so assisted by relatives has greatly increased. Without the immigration restriction law, which limits the numbers of those who may come to the United States, it has been estimated that several million persons would have left the war-stricken areas of Europe for America. American immigration began as a colonial movement on a very limited scale, and largely in the nature of an experiment. The bulk of the new comers were from the British Isles, although the French established outposts in Canada, and the Dutch founded the colony of New Amsterdam. In the extreme south were a few Spanish settlements, but Spanish immigration never played a large part in the history of North America. The Swedes established a colony in New Jersey, and the Germans in Pennsylvania, but the growth of the English and Scotch-Irish population soon absorbed these groups. In the first two decades of the 19th century the great movement of new British immigration commenced, followed shortly afterward by the Irish waves, and in the middle of the century by the first great German migration.

By 1800 the population of the United States had increased to 5,300,000, and by 1810 to 7,200,000. By 1820 it had grown to 9,600,000. In that year the number of incoming aliens, recorded for the first time, was only a few more than 8,000. The most striking annual increases were from 114,371 in 1845 to 154,416 in 1846, and 234,968 in 1847. These sudden movements of population were chiefly due to hard times in Europe and especially in Ireland, a cause which, with the Revolution of 1848 in Germany, continued to operate until 1854, when a total of 427,053 was reached, a figure not again attained until nearly twenty years later. But in 1863 a gradual increase once more set in, and in 1869, 352,768 persons landed. During the whole of this period the only immigration of importance came from Europe and from other parts of America. Immigration from Asia, which began in 1853, consisted, in the largest year, 1854, of 13,100 persons. In 1869 the ethnic composition of immigration commenced in a marked way to change. South-eastern Europe began to vie with North-western Europe in the number of immigrants sent to this country. A part of this sudden increase dated to 1882 and the two subse-

quent years, and was due to the now famous May laws promulgated by Russia which caused large numbers of Hebrews to emigrate in a body, so to speak. Although the change in ethnic composition of the immigrant stream began to be apparent during the decade of the '70s, only 8.5 per cent of the total immigration from 1871-1880 belonged actually to the 'new' immigration.

The Census of 1890 shows that up to that time the 'new' immigration had furnished only 854,962 persons as compared to 7,165,646 of the 'old' immigration. In the decade 1891-1900 the 'new' immigration furnished 52 per cent of the total, and in 1901-1910 it supplied 76.7 per cent. Despite the war, this figure climbed in 1911-1920 to 77.6 per cent, showing a complete reversal of national origins since 1880. The principal elements of this new immigration came from Italy, Austria-Hungary, Poland, Russia, and the Balkans. They included many hundreds of thousands of Jews, some coming from Russia, some from Austria-Hungary, and others from the other countries.

During the period of World War I the number of immigrants annually reaching American shores showed a marked decrease. The close of the war, however, and the beginning of the reconstruction period witnessed the return of the immigrant. Within the twelve months, ending June 30, 1920, approximately 800,000 immigrants entered the United States. Many estimates of the volume of immigration take no account of the fact that the annual emigration considerably reduces the net total. Unfortunately, until recently no accurate records were available of emigration from America, but from records now available and from fairly correct estimates for previous years it is clear that a considerable percentage of the influx emigrates annually.

Immigration of Asiatics to the Pacific Coast of America has presented serious problems and has caused incessant friction. Race prejudice is the principal cause of the trouble. The fact that Asiatics have been willing to work longer, for less pay, and live more cheaply and in poorer quarters than the whites has played an increasingly important rôle in stimulating race hatred. As long ago as 1851 nearly 3,000 Chinese entered California, many of them going to the mines. By 1860 there were more than 20,000 engaged in gold mining. They were looked upon by the white men as in the same class as Indians and Negroes, and were frequently

'run out of town' and on occasions beaten and even murdered. The anti-Chinese sentiment increased as the volume of Chinese immigration grew. During the '70s and '80s acts of violence were frequent, and feeling became so strong that Congress in 1882 passed the first drastic exclusion law.

The Japanese did not begin to come to the United States in large numbers until the year 1900, and from then on drew to themselves the race prejudice formerly directed against the Chinese. Like the Chinese, many went into personal service, but large numbers went also into agriculture, and formed colonies which prospered greatly. The restrictions as to schools, the ownership of land, and citizenship, which had been invoked against the Chinese were also placed upon them, much to the detriment of friendly relations between the governments of the United States and Japan. The U. S. Census Bureau reports that in 1850 there were 758 Chinese in the United States. In 1854 more than 5,000 immigrants came in, and in 1855 the number of immigrants had doubled. By 1870 this figure had risen to 63,042, and by 1890 it had reached its peak of 106,688. The 1920 census reported only 61,639 Chinese, of whom nearly one half were in California. This rise and fall of Chinese immigration is intimately connected with the growth of the Pacific Coast States, and with the anti-Asian sentiment which grew stronger in proportion to the increase in the number of Asiatic immigrants.

The first legal manifestation of the growing hostility to the Chinese immigrants was the effort of the Californians in 1862 to obtain the support of the Federal Government for local restrictions against them. This failed to curtail the inflow, however, and in 1872 the State legislature sought to have their Representatives in Congress use their influence. In 1875 Congress put an end to importing Chinese coolies by contract, but this did little to slow the influx. In 1880 a treaty was negotiated with China granting to the government of the United States the right to regulate, limit, or suspend the immigration of Chinese laborers when the interests of the country so demanded. This was followed by an act of Congress in 1882, providing that all immigration of Chinese laborers, skilled and unskilled, should be suspended for ten years. In 1888 a second treaty was negotiated with China, but never ratified, providing that China should of her own accord regulate the emigration of her subjects to the United States. In 1892 the Chinese exclusion act was

renewed and in 1894 the exclusion provision was embodied in a treaty with China. This was not renewed when it expired in 1904, and Congress again enacted an exclusion law which remained in force until the Immigration Restriction Law of 1924. No Chinese may become citizens of the United States except by birth.

In 1890 there were, according to U. S. Census figures, 2,292 Japanese in the United States. By 1910 this figure had grown to 72,157 and in 1920 it was 111,010. Of this last number 93,490 were in the three Pacific States, and 71,952 in California alone. The migration differed somewhat from the Chinese in that the Japanese not only were more prone to bring their families, but that they settled in colonies taking up the best available land, and rapidly extending their sway, with characteristic thrift and energy. Hence, as early as 1905 there was a strong movement in California to curb immigration. This resulted in the negotiation by Secretary of State Elihu Root, under the direction of President Roosevelt, of what is known as the 'Gentlemen's Agreement,' according to which the Japanese Government agreed to limit the passage of Japanese laborers to America. This agreement remained in force until the passage of the Immigration Restriction Act of 1924.

The Gentlemen's Agreement or understanding, the terms of which were never made public while it was in force, was entered into in 1907 between the governments of Japan and the United States. By its terms Japan agreed to withhold passports from Japanese laborers wishing to go to the United States. Immediately upon conclusion of this agreement, Japanese immigration fell off sharply and it looked as if the anti-Japanese feeling in California had been placated. But even the Gentlemen's Agreement did not prevent the California legislature from imposing fresh restrictions upon the Japanese within the State. In 1913 that body enacted a law preventing Japanese individuals from owning land. In 1920 another act was passed with the purpose of preventing alien Japanese from holding lands in the name of their minor American-born children, and also restricting the rights of Japanese-owned corporations from acquiring land. These acts aroused much hostility in Japan. The objections of the Japanese government caused no little embarrassment to the Department of State in its dealings with the State of California.

When the Immigration Restriction Act of

1924 was being considered in Congress, the Japanese government called the attention of the Secretary of State to the fact that it contained a clause which virtually prohibited entirely any further immigration from Japan. This clause, the Japanese Ambassador pointed out, not only was in violation of the Gentlemen's Agreement, but would, if enacted into law, have 'grave consequences' upon the friendly relations of the two nations. Apparently without realizing the effect of such a document upon Congress, the Secretary of State forthwith transmitted it to the Senate. That body at once seized on the phrase 'grave consequences' and construed it as a threat. On the ground that the Japanese government was endeavoring to interfere in a purely domestic question, the Senate at once enacted the objectionable feature of the bill. The President and Secretary of State later used their influence to have this provision modified or stricken out, but failed. It was accepted by both houses, and signed by the President under protest. On July 1, 1924, it went into effect, and thus terminated the Gentlemen's Agreement.

The new law prohibits the admission of aliens ineligible to citizenship with the exception of government officials, their families, attendants and servants, temporary tourists, business men, ministers of any religious denomination, teachers and professors, with their wives and unmarried children under eighteen years of age, and bona fide students over fifteen years of age. Inasmuch as Asiatics are not considered members of the white race, they are not eligible to citizenship. For purposes of immigration Hawaii and the insular possessions of the United States have been considered in a separate category from the mainland. Hence, not only have separate statistics been kept by the government, but restrictions applicable on the mainland have not been enforced in the Islands. The Gentlemen's Agreement made reference only to continental United States. As a result, although the Japanese government later voluntarily curtailed the movements of Japanese to the Hawaiian Islands, the United States has consistently refused to permit the Hawaiian Japanese to come to the United States. At the same time, Japanese laborers may no longer go to Hawaii. The census figures show that the number of Japanese in the Islands increased from 12,360 in 1890, to 61,111 in 1900, and 79,675 in 1910. By 1911 they numbered 124,551, or 5 per cent of the total population.

The beginning of national regulation of immigration was marked by the law, approved March 3, 1875, which provided that persons convicted of non-political felonious crimes, and women imported for the purposes of prostitution should not be allowed to immigrate to the United States. The first general immigration law was enacted in 1882. The law provided that a head tax of 50 cents be levied on every passenger not a citizen of the United States coming from a foreign port to any port within the United States. The money so collected was paid into the immigrant fund for use in regulating immigration and caring for needy immigrants. In 1885 the first contract-labor law was enacted, making it unlawful to assist or encourage immigration under contract for labor in the United States. Such contracts were considered void, and a fine of \$1,000 was imposed upon those violating the act. In 1887 this act was amended to give the Secretary of the Treasury the power to exclude and deport contract laborers.

The immigration act of 1891 provided that convicts, lunatics, paupers, and idiots, also persons suffering from contagious diseases, and polygamists were excluded. The office of superintendent of immigration, with entire charge of immigration matters was established by this law. In 1903 a bill was approved providing for a head tax of \$2 upon all foreigners, except citizens of Canada, Cuba, or Mexico, excluding idiots, insane persons, epileptics, paupers, professional beggars, persons afflicted with contagious diseases, convicts, polygamists, anarchists, prostitutes, contract laborers, and assisted persons, providing inspection of immigrants at the port of entry, and establishing the office of Commissioner General of Immigration as well as the Board of Immigration.

No legislation of importance followed until 1907, when the head tax was increased from \$2 to \$4. The immigration act of February, 1917, which repealed the act of February, 1907, and all prior acts or parts of acts inconsistent with the act of 1917, provided for a tax of eight dollars on every alien entering the United States, except children under sixteen years of age accompanied by their father or mother, to be paid by the transportation line or other convenience bringing such alien into this country.

On Oct. 16, 1918, the Congress of the United States passed an act providing that aliens who are anarchists, who believe in and advocate the overthrow of the Government

of the United States, the registration of public officials, the unlawful destruction of property, or are members of any organization which holds such beliefs, shall be excluded from the country, and that any alien who, after entering the United States, becomes a member of this class, shall be taken into custody and deported and if he attempts to return to or re-enter the United States he shall be deemed guilty of a felony and punished by imprisonment for a term of not more than five years at the end of which imprisonment he shall be again deported. On Oct. 19, 1918, the same Congress passed a joint resolution authorizing the readmission to the United States of certain aliens who were conscripted or volunteered for service with the military forces of the United States or co-belligerent forces even though they might otherwise be excluded under certain requirements of the immigration act of Feb. 1917, provided they can show that the disability was required while serving in the military or naval forces of the Allies, and they return to the United States within two years after the termination of the war.

An act of Congress, approved June 5, 1920, amended the acts of 1918 to include also under the prescribed penalty those aliens who write and publish or who circulate written or printed matter advocating the overthrow of the Government of the United States, the assaulting or killing of officials, the damage or destruction of property, and sabotage. Efforts to limit the number of immigrants coming to the United States had been made on numerous occasions prior to 1921, but it was not until that year that Congress considered and finally passed a drastic restriction law. As a result of World War I, immigration from Europe, which had reached 1,058,855 in 1913, dropped in 1919 to 24,627. The following year it jumped to 246,295, and in the year ending June 30, 1921, totalled 652,364. In order to check further floods, Congress enacted a law limiting for the period of one year the total number of immigrants from any one country in Europe to 3 per cent of the number of persons residing in the United States shown by the 1910 census to have been born in each of those countries. The quota restrictions did not apply to the countries in the Western Hemisphere or to the Asiatic barred zones.

This law had numerous technical imperfections. In the first place it divided the quotas into five installments of 20 per cent each. As a result, the entire immigration

arrived during the first five months of the year. Inasmuch as there was no adequate system of checking at the ports of departure, it was not infrequent for persons to sail from Europe only to find, on their arrival, that the quota for their nationality was filled, and that they had therefore to be deported. Despite these administrative defects, however, the law was renewed for the year ending June 30, 1923, and again until June 30, 1924. In the meantime, however, agitation for a permanent restriction policy had become so strong that during the summer of 1923 and winter of 1924 a new bill was drawn, eliminating most of the objectionable features of the temporary measure. This bill was introduced into the House by Congressman Johnson of Washington, and after being amended in accordance with suggestions made by Senator Reed of Pennsylvania, was finally passed by both houses and on May 26, 1924, was signed by the President.

This law marks a revolutionary departure in America's immigration policy. On the theory that the great mass of Americans are descended from the peoples of Northern and Western Europe, it aims deliberately to limit the numbers of immigrants from the Southern and Eastern European countries. The new law differs from the old in three important particulars. In the first place, it bases the quotas on the 1890 census and limits them to 2 per cent of the foreign born as shown in that census. In the second place, it provided that after July 1, 1927, the maximum number of immigrants admissible from the countries to which the law applies should be 150,000, and these should be apportioned in accordance with the so-called 'national origins' principle. In the third place it permanently excluded all but certain classes of Asiatics. The advocates of the measure chose the census figures of 1890 because these showed about the same relative proportion between the 'new' and the 'old' immigration that existed during the development of the country. In other words, it favored the nationals of Northern and Western Europe at the expense of those from the South and East. The so-called 'national origins' principle marks an even further departure from former immigration policies than does the limitation based on 2 per cent of the foreign born according to the 1890 census. The act reads that 'after July 1, 1927, the maximum total number of immigrants that shall be admitted into the United States in each fiscal year shall, unless the Congress shall in the interim provide

otherwise, be one hundred and fifty thousand, and the annual quota of each nationality shall bear the same ratio to said maximum total number of immigrants as the number of inhabitants of the United States having that national or an shall bear to the whole number of inhabitants other than the descendants of involuntary immigrants'

The immigration restriction law of 1924 defines the term 'immigrant' as any alien departing for the United States from any place outside the Western Hemisphere with the following exceptions (1) government officials with their families, servants and attendants, (2) tourists and business men on temporary visits, (3) aliens in continuous transit through the United States, (4) aliens lawfully admitted, but passing in transit through foreign contiguous territory, (5) bona fide alien seamen in the pursuit of their calling, (6) aliens previously lawfully admitted and returning from temporary visits abroad, (7) aliens entitled to enter the United States solely to carry on trade under and in pursuance of the provisions of a present existing treaty of commerce and navigation. Bona fide students, and ministers of religion, professors and teachers, together with their families, excluding children over eighteen years of age, are also classed as outside the quotas.

Among the new administrative provisions of the 1924 law the most important is that which relates to certificates and visas. Under the old system no tally was kept by the consuls in the ports of departure as to the numbers admissible to the United States. Under the new law visa certificates are issued to prospective immigrants not in excess of the quotas of each nationality. They are good for a period not exceeding six months and entitle them to admission provided they pass the necessary physical and other examinations embodied in the law of 1917 and subsequent acts. The information required by the consuls includes various records kept by the government to which the immigrant owes allegiance. In the Immigration Quota Law, in effect July 1, 1929, about 153,900 may be admitted each year. The quota does not restrict natives of Canada, Mexico, or Central and South American countries. Consult Stephenson's *History of Immigration* (1926), Davis's *World Immigration* (1936), Hansen's *Immigration in American History* (1940).

**Immoral Agreement**, an agreement to do an immoral act or an agreement based on an immoral consideration. Though the term

is sometimes loosely employed so as to include all acts prohibited by law it is strictly applicable to sexual immorality only. Any agreement having for its object the formation of immoral relations is void as being contrary to public policy.

**Immortality**, the continued existence of the soul or mind after physical death. The belief common in some form to the majority of civilized peoples involves one or more of the following elements: (1) The resurrection of the body, (2) the continued existence of a definite soul-substance or personality, (a) conscious or (b) unconscious of its past experience, (3) survival in personal influence only. This belief, however, has some widespread exceptions. In Hinduism the goal sought is absorption, after many future lives, into the Universal Spirit, while in Buddhism Nirvana, or complete extinction, is the desired end. The first evidences of a belief in survival after death appear in the New Stone Age, perhaps 50,000 years ago. Food, tools, and weapons were left in the tombs of the dead, evidently as a provision for their life after death.

The Egyptians believed that the spirits of the dead descended to the under world for judgment, but the embalming of the body seems to indicate that they expected a reunion of the soul and body. The modern development of scientific method has led the majority of people to realize that immortality is not yet demonstrable, and attempts to prove it carry no conviction. Kant and Huxley denied that reason could give evidence of life after death, but Kant accepted the doctrine as a postulate, while Huxley, in the absence of either proof or disproof, maintained the agnostic attitude. The wish for and belief in immortality is inherent in most normal human beings. All that favors the belief is of a moral and spiritual nature, while all that argues against it is of a physical nature. On purely natural grounds, apart from the revelation of God to man, perhaps the strongest argument for the immortality of the human soul is the ineradicable instinct to moral responsibility—the conviction that each man is responsible for his actions and must sooner or later face the results of them. The teaching of Christ on the reality of a future existence is so unmistakable that to deny it is to reject Him.

See TRANSMIGRATION. Consult Plato's *Phaedo*, Ingersoll's *Lectures on Immortality*, Smyth's *Modern Belief in Immortality* (1910), Jefferson's *Why We May Believe in*

*Life after Death* (1911), Dickinson's *Religion and Immortality* (1911), McComb's *The Future Life in the Light of Modern Inquiry* (1919), Kheirallah's *Proof of the Existence and Immortality of the Soul* (1943)

**Immortelles** See **Everlastings**

**Immunity**, in law, is an exemption from serving in an office or performing duties which the law generally requires other citizens to perform, a personal benefit or favor granted by law contrary to the general rule, or an exemption from taxation.

**Immunity**, in medicine, implies a state of complete partial insusceptibility to the influence of certain drugs and certain morbid agents. Natural immunity is to some extent proportionate to the state of the general health. Every organism possesses within itself the means of protection against its parasitic enemies, and the more healthy the organism is, the stronger are its powers of self defence. Age is a factor, for adults seldom suffer from measles, scarlet fever, or whooping-cough. In certain diseases a degree of acquired immunity is conferred by one attack.

Artificial immunity may be conferred passively by the injection of the serum of an immune animal, or actively by the injection of attenuated or dead cultures of the specific micro organism. This general method of protective inoculation was empirically discovered for smallpox at the end of the 19th century by Jenner, but our real comprehension of it dates from the researches of Pasteur on chicken cholera and anthrax. It is certain that immunity can be practically produced in many diseases by administering small, gradually increasing doses of the poison, which stimulate the body to a corresponding reaction. In the case of diphtheria immunity is produced in the horse by injection of diphtheria toxin and the serum of the horse containing antitoxin is used to check the disease in the human patient. Vaccination against smallpox is accomplished by the use of virus from the same disease in the cow, which probably contains living weakened germs. In the case of typhoid fever, plague, and the streptococcus and staphylococcus infections, vaccination with killed cultures has been used with very favorable results.

See **BACTERIOLOGY**, **SERUM**. Consult *Limits of Immunity and Specific Therapy* (1929), Zinner's *Resistance to Infection Disease* (1941), W. Boyd's *Fundamentals of Immunology* (1974).

**Impact**, in its simplest aspect, refers to

the laws of collision of bodies. The impact may be comparatively slight, the bodies experiencing no permanent change of form, but simply a more or less abrupt alteration in their motions, or the impact may be so great as to cause shattering, or at least permanent deformation, of the impinging bodies. The dynamical discussion of these extreme cases is quite beyond our most powerful mathematics. It is evident, however, that the original kinetic energy of the impinging bodies will be largely transformed into other forms, such as heat and light. Such, for example, is the result of the impact of flint and steel, and in the birth of new stars, which are probably due to the collision of two cosmic masses, we have the same truth illustrated on a large scale. In cases of direct impact in which the impinging bodies are not rotating, a very simple dynamical law is generally assumed to hold, which may be expressed thus: the relative velocity of separation after impact bears a constant ratio to the relative velocity of approach before impact.

**Impalla** (*Palla*), a species of antelope (*Aepyceros melampus*), rather large and reddish brown in color, found in Africa, south of the Desert of Sahara, called roosbok by the Boers. Impallas are especially graceful and swift.

**Impatiens**, a genus of plants belonging to the order Geraniaceae, mostly bearing showy villous flowers with four petals. The common bal-m, or lady's slipper (*I. balsamifera*), is a well-known garden annual. See **BUSBY**.

**Impeachment**. In the United States, the term is usually restricted to the constitutional process for the removal from office of an official of the government by the concurrent action of the two houses of Congress or of a State legislature. The Federal Constitution vests the sole power of impeachment of the President or other officer of the National Government in the House of Representatives, and the sole power of trying such impeachments in the Senate.

The offences which render an officer liable to impeachment are treason, bribery, and other high crimes and misdemeanors. This has been defined to include any violation of the Constitution and laws which is of such a character as to render the culprit unfit to hold office under the government. The penalty in case of impeachment is limited to removal from office and disqualification to hold any office of trust, honor or profit under the government.

Other offices in our history have been impeached

ment proceedings been instituted against a President—in the case of Andrew Johnson, who was acquitted by a single vote See JOHNSON, ANDREW In English law impeachment is the prosecution of a commoner or a peer of the realm by the House of Commons at the bar of the House of Lords for treason or crime

**Impenetrability**, a property believed to be characteristic of all kinds of matter, in virtue of which it is impossible for two different portions of matter to occupy the same space at the same time

**Imperative, Categorical** See **Categorical Imperative**

**Imperialism**, a term formerly used to designate the character and policy of an empire ruled by an absolute monarchy, but now associated with the acquisition of foreign territory as colonies by the more powerful nations Previous to the war between the United States and Spain, in 1898, the word 'imperialism' was not included in the familiar terminology of American politics Since the close of that war, which resulted in the establishment of political relations between the United States government and territory over seas, the word has become current, and although it has given rise to acute differences of opinion, it stands for accepted facts

Imperialism in the American sense of the term may be viewed under two aspects the sovereign authority of the United States over territory not included therein under the articles and amendments of the Constitution, a policy of participation in world affairs This latter aspect may be considered a logical consequence of the Spanish War Although the United States must be considered always to have been a world power in the sense of asserting its rights, when necessary, against foreign countries, it was not admitted by the latter as of right into the circle of world powers until it had acquired foreign territories and its foreign policy had been moulded to some extent in accordance with the traditions of Europe Trade, as well as political instinct and expansion, necessitated this The extended Pacific Coast line of the United States meant, it was clearly seen, an American share in the future trade of the Pacific, the Philippines were the key to a vastly increased commerce with Asia The advice of George Washington to avoid entangling alliances is still respected, but it is qualified by the necessities of a political

eminence and power which the Fathers of the Constitution may not have foreseen Consult Coolidge's *United States as a World Power* (1908), Pierce's *Federal Usurpation* (1908), Fisher's *War of Empire* (1943), Nearing's *Tragedy of Empire* (1945)

**Impetigo Contagiosa** is a contagious skin disease characterized by the formation of pustular vesicles, which run together and become covered by a crust of dried discharge It can be cured by applying a suspension of microcrystalline sulfathiazole

**Implements and Machinery, Agricultural**, may be classified according to the sequence of agricultural operations, as follows implements used in preparing the soil for crops, in sowing seeds or manures, in cultivating growing crops, in harvesting or securing crops, in preparing crops for market, in preparing crops for home consumption, dairy implements and utensils Implements Used in Preparing the Soil for Crops include such tools as ploughs, cultivators, harrows, rollers, and diggers, all of which have to a great extent preserved their original form, although they have been adapted to steam and to other power Thus, a steam plough may carry from 8 to 16 ploughs, while various motor cultivators and other implements have been devised Implements used in sowing seeds or manures include various forms of drills, broadcast sowers, seed-barrows, and manure spreaders They are all designed to supersede handsowing Implements used in cultivating growing crops include various forms of horse as well as hand hoes They vary from one-row scufflers to multiple hoes and corn-drills which carry about 13 hoes, constructed to follow a 13-colter drill

Implements used in harvesting or securing crops include self-binders, reaping machines, mowing machines, loaders, stackers, swath-turners, horse-rakes, and hay-tedders There are also several kinds of mechanical potato-diggers and root-toppers in use The threshing machine is the most important implement for preparing crops for market A good modern threshing machine separates and delivers simultaneously the straw and the grain, stacking the former In many modern threshing machines a chaff-cutter is attached, which delivers the cut straw into bags, or an apparatus is added which ties the straw in bundles Implements used in preparing crops for home consumption include grist-mills kibblers, bruisers, chaff-cutters and

ers, root-pulpers, root-slicers and shredders, and oil-cake breakers. Dairy implements and utensils are described under DAIRYING and CHURNS. See AGRICULTURE.

**Imports and Exports.** See Exports and Imports.

**Impotency** implies a temporary or permanent condition of the male generative organs which prevents the sexual act. The term should be distinguished from sterility, which does not prevent sexual union, but renders it unfruitful. See DIVORCE, MARRIAGE.

**Impound** is to place a chattel in official custody. The term is used of the judicial process whereby important documents used in the trial of a case and whose loss or destruction might defeat the ends of justice are retained in the custody of the court. The term is also employed to denote the placing in a pound of cattle which have been taken up as astray or taken damage feasant. See POUND.

**Impressionism, Impressionists.** There are no words more common in modern art criticism, but it is not easy to ascertain what impressionism is and is not, or who the impressionists are, why they are thus designated, and what are the central ideas which distinguish painters so unique in method and manner as Manet and Delacroix, Claude Monet and Monticelli, Degas and Renoir, Besnard and Raffaelli, Carrière and Forain, Whistler and Pissarro, Guthrie and Steer. A few artists and students know that the fundamental principle of impressionism is as old as art itself, and that it is only in certain conscious directions that some modern painters and groups of painters may be distinguished as impressionists. In Great Britain there are the Glasgow school, the New English Art Club. Whistler and Sargent stand for America, though their genius is not of any country and their accent is cosmopolitan. In French art, how many names occur from Claude Monet to the latest New-Salonist. As to the designation now so familiar, it was not, as commonly stated, formulated by Courbet or any other, or by the group of innovators collectively. One day Claude Monet exhibited a picture called *The Impressionist*, the title was at once taken up, and from that day the painters constituting this small group, and the great number to be classed with them now, were and are called impressionists. The group, or movement as it is commonly called, as such owed more

to Courbet and to Manet than to any other.

The first real victory of impressionism was in the revolutionary excitement caused in the French art world by the representative posthumous exhibition of Manet's work in 1884. The first official recognition was when the ministry of fine arts availed itself of the liberality of the artist and connoisseur Caillebotte, and in 1897 opened the Salle Caillebotte, or Salle des Impressionistes, in the Luxembourg national collection. Here the whole reach of contemporary impressionism may be studied. A first acquaintance with the paintings in the Salle Caillebotte will doubtless leave the uninformed visitor with several disillusionings, for tentative work is generally lacking in finality. But the student will gather from this strangely dissimilar company that impressionism, as the best French critics now agree, resolves itself, despite its divergencies, into three ideals—the reproduction of the real (actuality), the quest of the beauty and mystery of light, the effort to seize some instantaneous aspect of life, and faithfully to reproduce that vivid impression, as distinct from the mere reproduction of this or that detail or series of details. For the first, Manet stands representative, for the second, Claude Monet, for the third, Degas or Renoir. If unquestionably Monet, Renoir, Pissarro, Jongkind, Cezanne, Sisley, were influenced in two directions by Courbet and Corot—by the one towards actuality, and by the other towards the painting of light and atmosphere—their chief precursor was Delacroix, since the time of Rembrandt the most potent individuality in French art.

Manet was the first great realist in modern French art. What he or others for him called impressionism would not now so be characterized. It is true, actuality is a fundamental principle with the impressionists, and Manet's ideal was of actuality, but in his intense earnestness he strove (and taught others to strive) for an ideal of reproduction rather than of interpretation, for a convincing literality rather than a persuading synthesis. Courbet, again, would not now be called an impressionist. He was so called because he discarded tradition and convention, saw for himself, painted only what he saw, what he felt, what he believed, and painted in his own way. His life was a potent revolutionary force. It was his actuality, this realism, of Courbet and Manet, which led to the post-



tency and extent of the great movement of modernity in contemporary art, but there is no other direct connection between these two artists and Claude Monet and the neo-impressionists. Their real leader is Eugène Delacroix. The first public sale by the luminarists or impressionists was in the spring of 1875. Every picture went for ludicrous sums. So bitter was the hostility that police precautions had to be taken. Yet these painters were but following the example of Rembrandt, of Delacroix—seeking to paint light, to reveal a new and beautiful world in the wonder and glory of sunshine, and to do so by discarding dark and obscure colors and adopting those, radiant, living, which came nearest to the prismatic hues. Twenty-four years later, one of the greatest events in the art world of Paris was the Choquet sale, when works of the once derided painters were sold at high prices.

There are with this vital school of modernity four main directions in expression. Their exemplars are: Those who are concerned with the spiritual and poetic interpretation of nature and the primitive life of man in nature—Huet, Millet, Rousseau, Daubigny, Troyon, Dürz, Corot, Dupré, Pointelin, Bastien-Lepage, to select ten representative names; those who are concerned with the visionary and imaginative and spiritual interpretation of life of the mind and soul, either expressed in pictorial symbolism, as with Gustave Moreau, or in decorative beauty, as with Puvis de Chavannes, or with spiritual revelation, as with Eugène Carrière; those who are concerned solely with 'the veritable art of the thing seen,' of whom Gustave Courbet is the leader, then there are those who are concerned with the *verité vraie* as much as Courbet was, but with the effort to recapture the fleeting line and curve, the fugitive beauty in the brilliant moment, the resting light, the sudden passage of light, drifting shadow, the *tout ensemble* of motion and light, the breath, the thrill, the importunate emotion of life—Géricault, Delacroix, Decamps, Fromentin, Marillat, Bida, Monet, Renoir, Pissarro, Cézanne, Sisley, Degris, etc.

The influence of Impressionism is perhaps less noticeable in America than elsewhere, because American painters are concerned rather with the practical application of the principle to works of art than in the studies illustrative of the theory. Its influence, however, has been none the less profound,

and it is no exaggeration to say that it has caused the general adoption of a lighter tone of color, and made American artists as much concerned with problems of light as those of any other country. This is especially true of the younger men. Among those identified with the Impressionistic movement in America were the late Theodore Robinson and John H. Twachtman, and among living artists, Julian Alden Weir, Childe Hassam, and Mary Cassatt. The last-named artist, one of the earliest adherents of the school in Paris, was especially successful in depicting children and the maternal relation. See Duret, *Les peintres impressionnistes* (1878), Lecomte, *L'art impressionniste* (1892), Muther, *History of Modern Painting*, vol. II (1896), *Impressionist Painting* (1905), Frank Rutter, *Evolution in Modern Art* (1926), Thomas Craven, *Modern Art* (1934), Random House, *French Impressionists* (1944).

**Impressment**, the compulsory enlistment of soldiers or sailors in time of war. It was formerly extensively employed in England both in the military and naval service, but was, as to the former, restrained by acts of Parliament in early date and finally abolished in the 16th year of Charles I. The assertion of the right to take British seamen for this purpose from neutral ships on the high seas was one of the grievances of the United States against Great Britain which resulted in the War of 1812.

**Imprisonment**, confinement of a person in a prison or other house of detention. When effected without authority of law the act is denoted false imprisonment, and subjects the offender to an action for damages at the instance of the injured party. (See FALSE IMPRISONMENT.) Imprisonment is employed by the duly constituted authorities for various purposes, the principal of which are (1) punishment for crime, (2) detention until trial of a person accused of a criminal offence, (3) punishment for contempt of court, (4) coercion to compel the performance of a judgment or decree, and (5) detention of a person to secure his attendance as a witness in criminal proceedings. Imprisonment was formerly also resorted to to compel the payment of debt by insolvent debtors, but this method of coercion has in most civilized countries been abandoned. Imprisonment has, since the abolition of the more barbarous methods of penal discipline formerly

employed, become the commonest mode of inflicting punishment for crime. It has shared in the gradual reform of the penal laws and, through the improvement in the condition of the prisons and of prison fare and the general substitution of imprisonment of hard labor for solitary confinement, has become much more humane than it was in the middle of the 19th century. (See PRISON, PENAL STATUTES.) The period of imprisonment for the various crimes is fixed by statute, there being usually a minimum and maximum limit, within which the magistrate empowered to impose sentence may exercise his discretion. A recent reform of the penal laws in New York and a few other states enables the judge in a proper case to commit a convicted criminal to prison for an indefinite term, the actual period of imprisonment depending on the behavior of the prisoner. Imprisonment as a means of judicial coercion is less frequently employed, though it remains, as it always has been, the principal instrument of the courts of equity to enforce compliance with their decrees. See article on EQUITY.

**Improvisation**, the art of composing verses without previous preparation, and either with or without the accompaniment of a musical instrument. It was practiced to some extent by the ancient Greeks and Romans, but is more particularly an accomplishment of modern Italy. In fact, the 'father' of the art is Petrarch (14th century). Among the more distinguished exponents of the art may be mentioned Marone, Accolti, Cristoforo, and Antoniani, all of whom flourished in the 16th century. Perfetti (1680-1747), who was crowned on the Capitol at Rome by Pope Benedict VIII, the poet Metastasio, Corilla Olimpica, the original of Madame de Staël's Corinne, who also was crowned on the Capitol in 1776, then later Serio and Rossi, Syriac (1798-1836), and Signora Mazzei. Outside of Italy the gift has been possessed by the Swedish poet Bellman, by Daniel Schubart and Hoffman von Fallersleben in Germany, by De Pradel in France, and by De Clercq in Holland. Most great musical composers have been improvisers in their own special art, and so have some of the great pianists.

**Imputation** (L. *im+putare*, 'to think in'), a theological doctrine intimately related to the orthodox view of the atonement. The sin of Adam is said by Calvinists to be im-

puted to his posterity, who in him have incurred a guilt for which they are not personally responsible (original sin), and in a similar way the righteousness of Christ is imputed to those who by faith receive Him, having no merit of their own. See *The Thirty-nine Articles* (Nos 9 and 11), *Westminster Confession* (chap. 10).

**Imro**, International Macedonian Revolutionary Organization, a Macedonian faction in Yugoslavia. In May, 1934, Bulgarian outlawed the party, and the Macedonian territory was broken up.

**Inagua**, Great and Little, two of the Bahama Islands, West Indies, to the n of the Windward Passage, between Cuba and Haiti. Great Inagua is 50 m long by 25 broad, and has salt marshes. Little Inagua lies 12 m to the n, and measures 8 by 6 m, p 667 (both islands).

**Inaja Palm** (*Maximiliana regia*), a South American palm over 100 ft high, with leaves from 30 to 50 ft long. These are pinnate and drooping, and their fibres are used by the natives for cordage, etc. From the fruit, which has a soft pulp and hard skin, monkeys find sustenance, and Amazonian Indians make a kind of flour which they use for seasoning. The spathes are used by the Indians as cradles and by hunters as cooking utensils.

**In articulo Mortis**, meaning 'at the point of death,' is a phrase sometimes used by lawyers, though it has no special legal significance. Dying declarations are admissible in evidence, but the question that arises is not whether the declarant was *in articulo mortis*, but whether he had given up all hope of recovery when he made the declaration.

**Inbreeding**. See BREEDING.

**Incandescence**. A body is in a state of incandescence when it glows or emits light by virtue of being at a high temperature. Incandescence varies greatly in degree, and is probably due to an increased rate of vibration of or in the molecules set up by mechanical force, chemical action, or the flow of electricity. As a body becomes progressively hotter it first becomes visible in the dark as a fog-gray object, then ash gray, then yellowish gray, then faintly red, then red-hot, orange, yellowish white, white-hot, and lastly bluish or even distinctly blue. Incandescence is usually witnessed in solids, never in liquids, sometimes in gases, as in the hydrogen flame.

**Incandescent Light** See **Gas Lighting**, **Gas Mantles**, **Electric Lamps**

**Incantation**, a set form of words, sung, intoned, or spoken, in the belief that it produces a supernatural effect. Among ancient peoples practically all the events of human life were attended by incantations. They were used to banish evil spirits, to summon good ones, to bring or keep away rain, to heal the sick, to bring success in war and love. They consist usually of a prescribed formula, often kept secret, involving the following elements: (1) sacred or powerful names, (2) invocations, threats, or entreaties, (3) expressions of the commands, wishes, or intentions of the offerer, (4) sacred narratives of events similar to those it is desired to effect. At the present day, incantations against diseases or other evils, and for guidance in the affairs of love, are frequently practiced among primitive peoples. See **MAGIC**. Consult Burne's *Handbook of Folklore*.

**Incarnation**, the act by which a supernatural being assumes a form of flesh, in Christian theology, the central fact of religion. Incarnations of the gods are common in ethnic religions, as in Hinduism—Krishna, but the idea is altogether more characteristic of the Indo-Germanic world than of the Semitic. In orthodox theology the conception of the incarnation of the Divine Son or Logos as expressed in the opening chapter of the Gospel of John, 1:14, 'And the Word became flesh.' See **JESUS CHRIST**.

**Incarvillea**, known as the Trumpet Flower, a genus of perennial plants belonging to the order Bignoniaceae. They bear large red or yellow tubular flowers in terminal clusters. There are about a dozen species native to Turkestan and China. *I. delavayi* is a greenhouse plant with large trumpet-shaped flowers of reddish purple, exceedingly decorative, *I. olgae* is a hardy plant bearing a profusion of beautiful pale pink blossoms.

**Incendiarism** See **Arson**

**Incense** (Latin *incendo*, 'to burn'), an aromatic substance giving off a pleasant odor during combustion, used in divine service. The Oriental fondness for strong perfumes, attributed also to the gods, is the probable basis of the common use in the Orient of incense in worship. The Babylonian epic, of unknown antiquity (5000 B.C.), makes the hero of the flood story offer incense on coming out of the Ark.

Its use by ancient Egyptians and Greeks is well known. The Hebrew code prescribed its use, and it is favorably mentioned in the New Testament.

In the Roman Church incense is used in the solemn (or high) mass, in the consecration of churches, in solemn consecrations of objects intended for use in public worship, and at the burial of the dead. There are also minor incensations of ministers, and a general incensation of the congregation. In the Anglican Church the use of incense is permitted. The incense at present in use consists of some resinous base. The ingredients are usually olibanum, benzoin, styrax, and powdered cascarilla bark. These are so placed in the censer as to be sprinkled by falling on a hot plate, which immediately volatilizes them, and diffuses their odor. See **FRANKINCENSE**.

**Incest**, carnal intercourse between a man and woman who are by reason of their relationship forbidden to intermarry. From a very early period it has been under the ban of the Church and in early European history it was punishable by the civil courts as well. In the United States, incest is a punishable crime, but the degrees within which marriage is permissible are regulated by the statutes of the various States. See **CONSANGUINITY**, **MARRIAGE**.

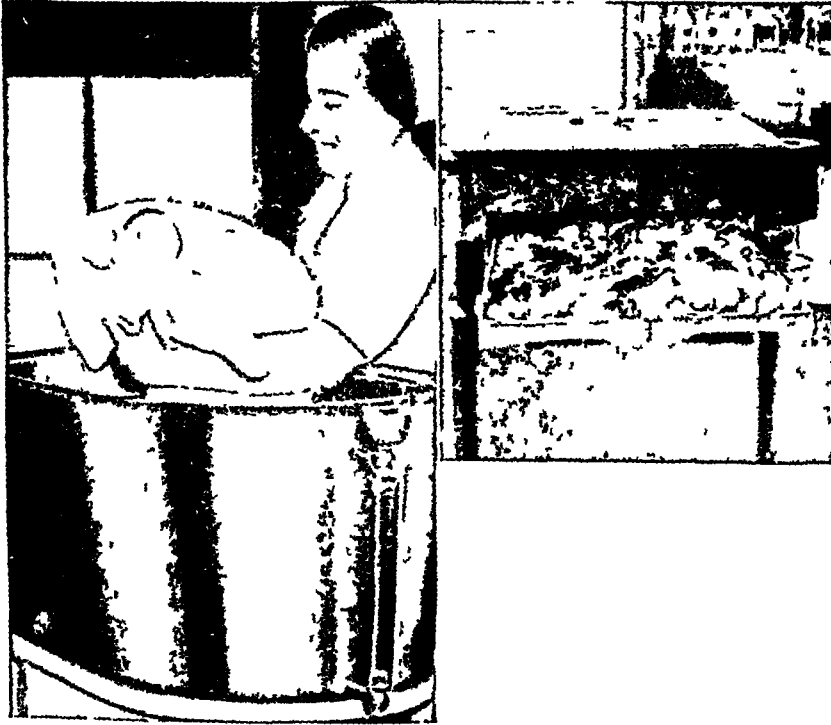
**Inclined Plane**, one of the so-called simple mechanical powers depending for its mechanical advantage upon the principle that in moving a body against a force we do work only against the component of the force in the direction of motion. Thus, in drawing a weight of 100 lbs up an incline of one in 20 we overcome a force equal to one-twentieth of the weight—i.e., 5 lbs.

**Income Tax**, a tax levied on net income by national, state, communal, or municipal governments, with wide variations in definitions of taxable income, rates, and methods of administration. The basic principles of income taxation are 4 (Seligman's *Income Tax*), (1) income means the total income, less expense of acquiring it, (2) it must be measured over a period of time, (3) its use must leave capital unimpaired, (4) it includes money income and profits which are easily computed as money value. In England the income tax has been assessed since 1842 without interruption, and while originally intended as a temporary expedient, and voted annually in that form, it is in reality a permanent part of the English fiscal system. As a regulating device

to balance receipts and expenditures, its rate is fixed annually by Parliament.

In 1934 income taxes were in force in Australia, Austria, Bolivia, Belgium, Canada, Czechoslovakia, Denmark, Danzig, Ecuador, Estonia, Finland, France, Germany, Great Britain, Hungary, Iceland, Italy, Luxembourg, Latvia, Lithuania, The Netherlands, New Zealand, Norway, Poland, Portugal, Rumania, Soviet Russia, Switzerland, Spain, Sweden, Tasmania, Yugoslavia, United States, Porto Rico. However European Continental laws are

tion to their population. In 1913, after a generation of agitation and effort, the Sixteenth Amendment making income taxation possible was ratified, and an income tax was enacted as a part of the Tariff Law of 1913. Since 1913 the income tax has remained a permanent source of revenue for the Federal Government. In 1924 Congress made the first attempt to differentiate between earned and unearned income. It was provided that 'in case of an individual the tax shall be credited with 25 per cent of the amount of the tax which should



*Incubators Left, for Infants, Right, for Chickens*

characterized by low exemptions, and by complex and detailed systems of graduation and differentiation.

**United States**—Under the burden of the Civil War an income tax was enacted in 1862 but proved unpopular, and after undergoing numerous alterations was abolished in 1872. In 1894 an income tax was imposed by the Wilson Tariff Act, but the Supreme Court held it unconstitutional on the ground that the income tax was a 'direct' tax and direct taxes must be apportioned among the different States in propor-

tion to their population. In 1913, after a generation of agitation and effort, the Sixteenth Amendment making income taxation possible was ratified, and an income tax was enacted as a part of the Tariff Law of 1913. Since 1913 the income tax has remained a permanent source of revenue for the Federal Government. In 1924 Congress made the first attempt to differentiate between earned and unearned income. It was provided that 'in case of an individual the tax shall be credited with 25 per cent of the amount of the tax which should

**State Income Tax Laws** deal with (1) determination of the persons subject to the tax, (2) definition of taxable income, (3) rates of taxation, (4) personal credits

or exemptions allowed, and (5) administrative organization. The States differ widely in their methods of handling these problems. Consult *Reports of the Commissioner of Internal Revenue*, A. L. Hurd, *Double Taxation of Property and Income* (1933), J. G. Herndon, *Your New Income Tax, and Relief from International Income Taxation* (1932), J. J. Klein, *Federal Income Taxation* (1931), H. D. Simpson, *The Effects of a Property Tax off-set under an Income Tax* (1932), *Federal and State Tax Systems Year Book*, *U. S. Master Tax Guide* (1946).

**Incommensurable**, in mathematics, is the term applied to a number which cannot be represented as a definite fraction—i.e., as the ratio of two whole numbers. The square roots of the vast majority of the natural numbers are incommensurables.

**Inconnu**, or **Mackenzie River Salmon** (*Stenodus mackenzii*), known locally as the CONNY, a fish inhabiting the rivers of Arctic America and Asia. The inconnu is an excellent food fish.

**Inconvertible Paper Currency**. Bank or government notes are said to be inconvertible when the holders are not entitled to claim from the issuers immediate payment of them in gold or silver.

**Incorporation**, the legal process by which a corporation is created. In the United States the power of creating corporations is vested in Congress and the State legislatures, which have passed general statutes defining the conditions.

**Incorporeal Property**, property that is not susceptible of seisin or physical possession.

**Increment, Unearned**, in economics, a phrase applied by J. S. Mill to denote an increase in the capital value of land arising solely from public improvements, the growth of population, and other causes not attributable to the efforts of the proprietor.

**Incubation** commonly signifies the process of developing the egg into a complete animal outside the body of the parent. Though in the strict sense of the term incubation is peculiar to birds, brooding over the eggs or the young is common also with some of the reptiles, amphibians, and insects. The only mammals to practice incubation are the echidna, which places its eggs in a pouch resembling that of the marsupials, and the ornithorhynchus, which broods its eggs in a nest in a burrow.

**Incubation Period**, in infective diseases,

signifies the term of development of the disease from the time of infection until the appearance of the outward symptoms.

**Incubators**. The art of hatching eggs by artificial means was known to the Chinese and Egyptians at a very early period. The first modern incubator which combined the essential properties of regulation of temperature, admission of fresh air, and control of moisture was invented by Thomas Christy, who employed hot water in a cistern which overlaid and partly surrounded an egg drawer, the whole being enclosed in a jacketed wooden chest. The more recent American incubators utilize hot air. The chief general principle involved in apparatus of this type is that they incubate entirely without supplied moisture, by reason of the fact that the warmed air is so admitted to the egg chamber as to obviate an evaporating draft or too rapid circulation of air in the interior. Regulation of temperature is effected by means of a bar thermostat.

Before placing the eggs in the machine they should be 'balanced' by standing on the large end for several hours. They are turned daily while hatching until the 18th day. They should be tested on the 7th, 11th, and 15th days, and all infertile or 'dead-in-the-shell' eggs promptly removed, as they emit unwholesome gases. While daily cooling for 5 to 10 minutes is commonly practiced, the Experiment Stations have proved that more and stronger chicks are raised from eggs which are not cooled. Compared with natural incubation, the percentage of incubator hatch is lower than for the hen. The mortality after hatching is larger among incubator chicks. After incubation the chicks are cared for in artificially heated brooders, and when sufficiently grown and feathered are gradually hardened to open-air life. The advantages of artificial incubation, however, are many. Chicks may be produced several weeks before the hens will set, and these early hatched chickens will begin to produce eggs correspondingly early in the following winter, with non-sitting breeds—the most profitable for egg production—artificial incubation is a necessity, and much larger numbers can be raised with a fraction of the care required in the case of hens.

**HUMAN INCUBATOR**—This is a device resembling the egg incubator, employed in preserving the lives of undersized and prematurely born infants. It was invented about 1840, but did not come into practical

use until 1878, when it was adopted by the Paris Maternity Hospital. The apparatus consists of a case with non-conducting walls, containing a suitable couch or cot, and having a double glass door through which the patient may be constantly watched without exposure to change of temperature. The interior is warmed to a temperature of 88° to 90° F by a circulating hot-water system automatically controlled by a thermostat. Fresh air, warmed and moistened, is supplied by a ventilating system. With the aid of this apparatus the mortality among

the United States. Among the forms of indecency thus prohibited by law are indecent exposure, the publication or posting of indecent advertisements, the exhibition of indecent pictures, the selling or giving away of obscene books or prints, the use of lewd and indecent expressions in public, the exhibition of indecent plays.

**Indecent Exposure**, or exposure of the person, is a common law offence committed by one who publicly reveals his naked body or some part thereof in a manner repugnant to ordinary decency or morality.



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*Independence Hall, Philadelphia,—South Front*

pre-maturely born children has been greatly reduced. Consult bulletins of the U S Department of Agriculture, Washington, D C.

**Incumbent**, in English law, the holder of an ecclesiastical benefice or living. The right to appoint an incumbent may be vested in a private individual to whom it may belong as a species of property.

**Incunabula**, the earliest printed books, a term generally confined to those issued before the year 1500.

**Indecency**, lewd, obscene, or grossly immoral conduct in public, made punishable as a crime by statute both in England and

**Indemnity** signifies protection or relief against loss or legal liability. A policy of fire insurance is perhaps the commonest example of a contract of indemnity against loss. An Act of Indemnity is a statute passed to free certain persons or classes of persons from civil or criminal liability in respect of facts committed by them. Indemnity is also used in a wider sense to include compensation of any kind, such as must, in terms of the Constitution, be paid to one whose property is compulsorily taken for public purposes.

**Indenture**, in law is a deed under the

seals of different parties employing mutual agreements entered into between them and having copies equal in number to the number of the parties to the transaction. These copies were all written on one and the same piece of paper, divided by a waved or indented line. After being cut apart along this indented line, the original copies when produced could be identified by matching their edges together. See **DEED**.

**Independence Bay**, in the northern part of Greenland, about lat  $81^{\circ} 37' N$ . It was discovered by R. E. Peary on July 4, 1892.

**Independence Day**, the anniversary of the adoption of Congress of the Declaration of Independence (July 4, 1776), is observed as a legal holiday throughout the United States.

**Independence, Declaration of** See **Declaration of Independence**.

**Independence Hall**, a famous historical building situated on Chestnut Street, Philadelphia. Originally erected in 1732-4, it was used as the Pennsylvania State House, and from 1775 to 1781 was the meeting place of the Continental Congress. Here Washington was appointed commander-in-chief, and in the east room the Declaration of Independence was signed. The famous Liberty Bell hangs in the rear hall of the first floor. The place was restored in 1898, and now contains a collection of Revolutionary relics.

**Independent Churches of Christ in Christian Union** See **Christian Union Churches**.

**Independent Labor Party of Great Britain**, The, was inaugurated at Bradford on Jan. 14, 1893. It was established with the object of bringing the trade unions of the country into the political arena as a distinct organization for securing direct representation of labor in Parliament, without any regard either to Liberalism or Toryism. The Independent Labor Party has been frankly a socialist organization from its inception.

**Independent Order of Oddfellows** See **Oddfellows**.

**Indeterminate Equation**. An equation involving two unknown quantities, and with no other condition imposed, admits of an unlimited number of solutions, such an equation is known as an indeterminate one.

**Indeterminate Sentence**, a sentence imposed upon an offender against the law, for an indefinite period of time between 3 and

10 years, the length to be determined by the behavior of the prisoner. The principle upon which the indeterminate sentence is based is that the primary object of imprisonment is the reformation of the offender and his restoration to society.

**Index**, in mathematics, is a number attached to a quantity to indicate the power to which that quantity is to be raised.

**Index, Cephalic** See **Anthropology**.

**Indexing**. The term index generally means a series of references to a given book or books arranged in alphabetical order, with subdivisions and cross references. It is of the utmost value, especially to students and scholars, and has come to be regarded almost as a necessity in works of reference. It is usually placed at the end of the work. The card catalogues of Modern Libraries are all good instances of the development of indexing in recent times. See also **CATALOGUING**.

**Index Librorum Prohibitorum, vel Expurgandorum**, a list of books officially prohibited by the Roman Church. While the writings of Arius are the earliest example of this prohibition, the first catalogue of forbidden works was by Pope Gelasius (492-6). Other editions have been published from time to time. Additions in the intervals between editions are made by decrees which are published at Rome and circulated in the various countries. The censoring and condemnation of books are vested in the Congregation of the Index, which has universal jurisdiction. The case of St. George Mivart, the celebrated naturalist, who was condemned for his articles in English periodicals, is a recent example of a modern author whose works have failed of approval. Some of the works of Jewell, Usher, Sanderson, Bull, Pearson, Chaucer, Spenser, Addison, Goldsmith, and Macaulay are in the Index.

**Index Numbers**, in economics are numbers designed to show the average of prices at any given time either for specified groups of commodities or in general. They are obtained by comparing the ratios of prices at the given time with prices at a previous date chosen as a standard and fixed arbitrarily at 100. The earliest use of the device is credited to an Italian, G. R. Ciri, as early as 1764. The five current series maintained in the United States are those of Bradstreet, Dun, U. S. Department of Labor, Thomas Gibson, and the New York Times *Analyst*.

India, a large peninsula in Asia, belonging to Great Britain India is almost surrounded by natural boundaries the Himalaya Mts on the n, the Sumelian Mts on the w, the Arabian Sea on the s w, the Indian Ocean on the s, the Bay of Bengal and some low mountain ranges on the e. The empire of India includes British India, that portion governed directly by British officials and the Indian States ruled by native officials subject to British control. The total area, including Burma on the e, is about 1,805,300 sq m and the population is about 352,000,000. The capital of India is New Delhi, p 447,442.

The physical divisions of India comprise the borderland on the n w frontier, the main Indian peninsula, with its three subdivisions of the alluvial plains of Upper India, the Dekkan (Deccan) plateau, and the maritime districts, and, finally, the province of Burma. *The Northwestern Borderland*—The crumpling and folding of the rocks in the late Tertiary times have given to India on the n w its magnificent frontier of mountain ranges, through the softer beds of which the rivers have cut a path to the Indus, and formed the passes by which friend and foe have poured into India. *The Peninsula*—The plains of the Indus and Gangetic systems owe alike their prosperity and their desolation to the rivers Indus, Jumna, Ganges, and Brahmaputra. On the n the Himalayas ('abode of snow') rise to a mean elevation of 18,000 ft in successive ranges, occupying a breadth of some 200 m, and sweeping in a continuous curve of 1,500 m from Kashmir to Assam. Beneath them lies a deep trough of rank vegetation, known as the Tarai, while the Sivaliks, the graveyard of countless mammals, raised by more recent disturbances, form a footrest to them from Hardwar to the banks of the Beas, and enclose the Duns, or valleys, of which Dehra Dun forms the largest bay of territory.

Below the mountain barrier stretch the alluvial plains, till on one side they reach the Arabian Sea, which washes the coasts of Kutch, and the Bay of Bengal on the other. On the w an uplifted arm of metamorphic rocks, known as the Aravalis, divides Rajputana, and their debris has helped to form the Vindhya Mountains, whose secondary sandstone formations are continued almost up to the Ganges below Benares. The Vindhyas form the divide between Hindustan and the Dekkan, and in the past this barrier diverted the course

of Aryan advance to the e of Bengal. The Ganges does not, like the Indus, rise on the farther slopes of the Himalayas, but on the seaward face of the higher ranges, finally uniting with the Brahmaputra to form the vast delta of 80 m along the Bay of Bengal.

The second division of the Indian continent is the great tableland of the Dekkan. The provinces of British India situated in the Dekkan are Bombay on the w, the Central Provinces and Berar in the n, Madras on the e and s, and on the s w the highland districts of Coorg perched on the West Ghats. The chief native states are Hyderabad and Mysore, with numerous Maratha states under Bombay and the Central India Agency. Most of the Dekkan is subject to frequent droughts. The maritime division includes on the e the districts of Madras and a fringe of Bengal, with the deltas formed by the Godavari and the Mahanadi, and on the w the districts of Bombay, Travancore and Cochin are the chief native states in this portion of the continent.

*Climate*—The whole country has three well-marked seasons—the cool, the hot, and the rainy. The cool months are November, December, January, and a part of February, the dry hot weather precedes, and the moist hot weather follows the periodical rains. The rainy season falls in the middle of summer and is called monsoon. It is the occasional failure of the monsoons that causes the periodical famines to which the country is liable. The central tableland is cool comparatively, but the alternations of heat and cold differ greatly elsewhere. In the n w there is burning heat with hot winds in summer, and frost at night in winter. In the s the heat is more tempered, but the winter is cool only, and not cold.

*Fauna*—The domesticated animals are, first, the cattle—cows, buffaloes, oxen, the last two do the work of agriculture. The bull and cow are sacred animals to Hindus, and by them are never killed for food. The indigenous breeds of horses in India are being improved by the importation of foreign sires. They have never been employed in agriculture. The pony, the donkey, and the mule are largely used. Sheep and goats are abundant. Pigs are plentiful, but they are despised by the upper and middle classes of the people. Monkeys are tame and are held sacred. Wild animals include the



tiger, panther, cheetah, boar, bear, bison, elephant, and rhinoceros. Crocodiles and alligators infest most of the rivers. Deer of all sorts abound. The elephant is used only for purposes of war or of state, both by the government and by the native nobility. Poisonous snakes abound. At the seaport towns the supply of fish is excellent, and fish-curing is largely practiced by the natives.

**Flora**—Cereals are abundant—rice, maize, millet, and wheat, and tropical products—tobacco, sugar, ginger, and spices—are plentiful. The indigenous flowers are not rich, the water-lilies being the best. Flowering shrubs are very fine. Of trees in the plains near the coasts the palm order has several varieties. Inland the mango fruit tree and the orange, the umbrageous banyan, the sacred peepul, and the bamboo are features in the landscape. In the hills the teak and other useful timber trees are obtained. In the Himalayas are the cedar, the pine, the fir, and the juniper.

**Civil Administration**—The Government of India Act, which embodies a new Constitution providing self-government for India, became effective April 1, 1937, as to the 11 provinces previously administered directly by British officials. It will extend to the states ruled by native princes having British treaty relations upon formal acceptance by these states, as provided in the Act. This constitution prescribes that the central government of India at New Delhi, shall include a British Governor-General and two native legislative chambers, one to be known as the Council of State and the other as the House of Assembly. From members of these bodies is to be constituted the Governor-General's Cabinet of Ministers to conduct all matters of Federal Government. Membership of the Council of State is to be partly through election on a franchise of about 100,000 persons and partly through appointment by native rulers. The House of Assembly is to be composed of 250 members chosen by provincial legislatures and some 125 members representing native rulers.

Each of the major provinces will have its provincial government headed by a British-appointed Governor and an elected legislature, the provincial Cabinet Ministers being selected from members of the legislature. In some provinces the legislature is to be bicameral, in others unicameral.

The Constitution defines the respective powers of the Federal and provincial governments, and provides that such powers as the rulers of states do not transfer to the

Federal Government will be reserved to them. Matters pertaining to the defense of India, to ecclesiastical affairs and to external relations outside the British Empire, are reserved to the Governor-General. Certain emergency prerogatives are vested in the Governor-General and provincial Governors with respect to their administrative spheres for use under extreme circumstances.

The new Constitution was not greeted with general satisfaction, for such could not be expected in so vast a country so affected by differences of race, religion and political ideals, all more or less influenced by the complications of caste, yet before the end of 1937 it was functioning in the 11 major provinces, but owing to the reluctance of the state rulers to yield up any of their autocratic powers, and the hesitancy of the provincial nationalists to enter into partnership with states dominated by personal rule, the new Federal Government failed to be established during 1938. The movement for dominion status grew in 1939 and in 1947 Britain promised independence in 1948.

**British Provinces**—Nowhere is education more widely diffused than in *Madras*, or the administration beset with fewer difficulties. The leading cities are Madras, pop. 647,000; Madurai, 182,000, and Trichinopoly, 143,000. Coffee, cardamom, and cinchona are the chief products of the well-wooded and picturesque tract of Coorg, which is often described as the Indian Switzerland. The *Bombay Presidency* consists of three well-marked divisions—the maritime strip of the Konkan, the plateau of the Dekkan, and the plains of Sind. Bombay, the capital, is the second city of India in population, 1,161,000. Poona, 250,000, Ahmadabad, 314,000, Surat, 114,868, and Karachi, 264,000, are large centers of commerce and population. The *Central Provinces* are in part liable to drought, but rich in forests and in tracts that yield full harvests of corn and cotton in favorable seasons. Nagpur, 101,415, is the headquarters of the governor, and Jabulpur, 124,000, is the only other considerable city of the provinces. North of Sind is the Punjab, with its capital at Lahore, 430,000. The United Provinces, with their capitals at Allahabad, 184,000, and Lucknow, 275,000, constitute the most important province in the empire. They are inhabited by a strong and thrifty population.

The chief city of Bengal is Calcutta, with its suburbs the most populous city in India. Its population, with Howrah, on the opposite bank of the Hughli, is 1,486,000, and

Patna, despite the terrible ravages of plague, has a population of 160,000. Altogether there are 16 large cities in Bengal, and no less than 14 of its districts have a population exceeding 2,000,000 each. The permanent settlement of the land tax is generally in force. The rainfall rarely fails except in Orissa. Assam, with its chief city, Shillong, has three divisions, of which two are in the valleys of the Brahmaputra and the Surma, and one in the hill districts. Tea is extensively cultivated, one-fifth of the population are aboriginals, and there is no large city in the province. Burma is described under another heading. Ajmere and Merwara form two small districts, with headquarters at Ajmere, a city containing a population of 120,000. British Baluchistan, with headquarters at Quetta, has a population of about 308,000. The Andaman and Nicobar Islands, of which Port Blair is the headquarters, are a penal settlement, with a population of 26,459.

*The Native States*—The native states number between six and seven hundred principalities of different sizes, enjoying various degrees of independence in their internal affairs, but having one feature in common—that the courts of British India exercise no jurisdiction over any of their inhabitants unless they are British subjects or British servants. Their territories are, in fact, foreign territory, and if their chiefs are unfit, from age or other cause, to administer them, the requisite authority and jurisdiction over their subjects are exercised for them by the suzerain power, courts of foreign jurisdiction being established not by the law of British India but by the will of the British government. At the same time, every native state, the largest as well as the smallest, enjoys only a limited independence. The British government has a right to regulate the strength and equipment of their military forces. No native state has any foreign or external relations. The protecting power acts for them in all international and interstate affairs. Even in the exercise of their internal administration, the British government interferes to prevent dismemberment, to suppress rebellions, to check gross misrule, and to stop inhuman practices, slavery, or religious persecutions. British policy thus maintains rule over an area of more than a million square miles, and a population estimated at seventy-two millions.

*Agriculture and Other Industries*—Of

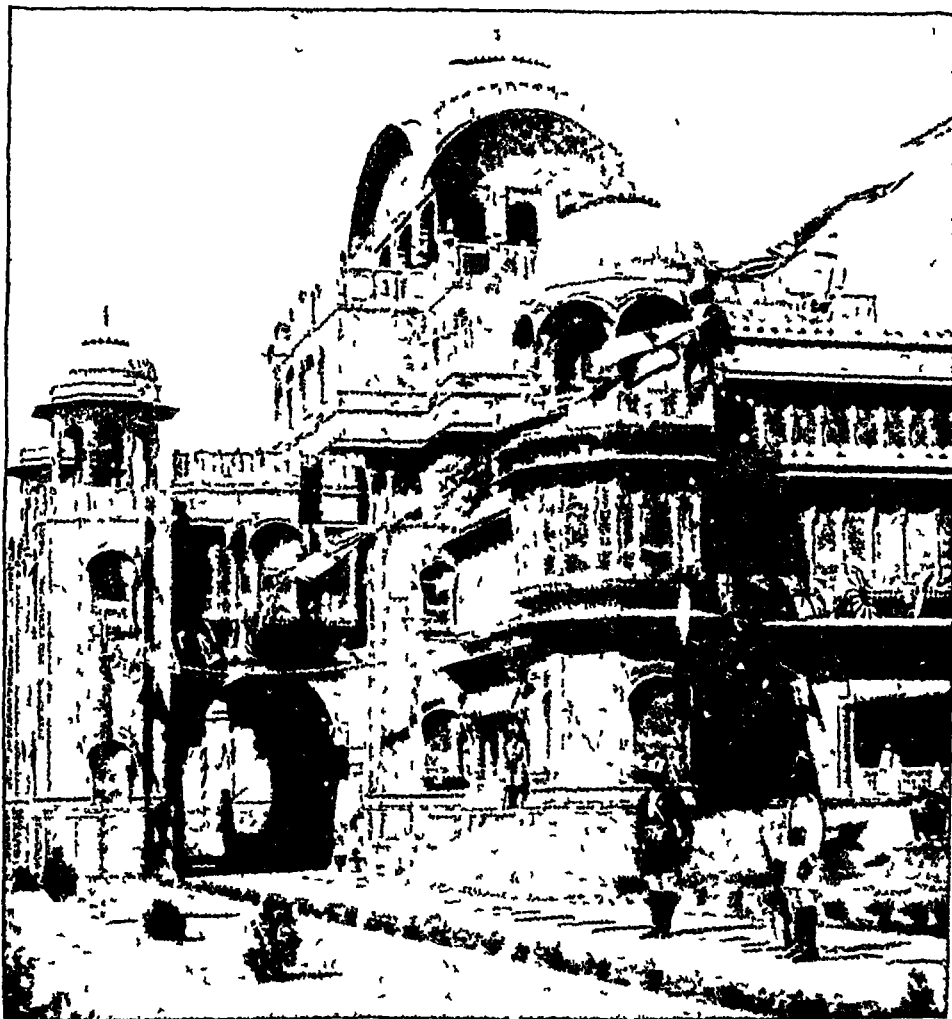
the whole population, whether in British India or in the native states, about 70 per cent either till the land or are engaged in operations directly connected with agriculture. The rural character of the Indian populations weakens their powers of co-operation or interest in national self-government, it renders them tenacious of local customs and traditions, it narrows their trade and commerce, and aggravates the distress caused by failure of rains or canals. If the rainfall is insufficient for agricultural operations, rural society is paralyzed. The cultivation of tea, the extension of cotton mills, and the development of the mineral resources of India partially relieve the tension, while schemes of irrigation have reclaimed the deserts of Sind, the Punjab, and parts of Rajputana, and even in the Dekhan have saved the people from much suffering. The conclusion at which the famine commissioners arrived in 1880 has been confirmed by subsequent years—viz., that all Indian famines are to be directly traced to the occurrence of seasons of unusual drought, and that British India invariably grows sufficient food supplies for its population. The prevention of famines, therefore, resolves itself into measures for increasing cultivation by irrigation, while the mitigation of famine depends upon the means of communication, with the timely provision of relief works and wages for those who can work, and gratuitous relief for those who cannot.

The principal crops are rice and millet, but very large quantities of wheat and other food grains, and of sugar, tea, cotton, oil seeds, opium, jute, indigo, and tobacco are cultivated. Tea culture is also of importance. The most important indigenous industry, after agriculture, is the weaving of cotton cloths. Other important industries are silk culture and weaving, shawl and carpet weaving, wood-carving and metal-working. India's mineral wealth is considerable: coal, gold, petroleum, salt, manganese ore, lead, iron ore, silver, platinum, and precious stones are produced. Communications are hardly less important than irrigation to an agricultural population. Railways are under the direct control of the supreme government, but the country is also traversed by good metalled roads in every direction.

*Language*—To the inhabitants of India, who, although generally a mixed race of Dravidian and Aryan origin, now form

many distinct nations, no general statement can apply. The acute but unwarlike inhabitants of the Gangetic delta are quite unlike the less intellectual but sturdier races of the upper basins of the Ganges and the Indus—the Northwestern Provinces and the Punjab. These latter again are dissimilar from the high-bred and chivalrous race

of those families—the Aryo-Indian, the Dravidian, and the Tibeto-Burman—represent the speech of 97 per cent of the inhabitants. To the first of these belong Hindi, Bengali, Marathi, Punjabi, Gujarati, Uriya, Urdu, and Sindhi, spoken by over 221,000,000 of people. Of the Dravidian group, the principal representatives are



*Maharajah's Palace, Bikaner, India*

of Rajasthan or Rajputana, and the hardy though humble Mahratta of the West Ghats. Still further varieties are found in the half-warlike and partly refined races of the eastern coast and southern peninsula, mixed up with races of lesser spirit and culture. Though nearly a hundred and fifty languages, derived from nearly twenty linguistic families, are spoken in India, three

Tamil, Telugu, Canarese, and Malayalam, spoken by 56,500,000. In the third group, the Tibeto-Burman, Burmese is spoken by some 9,500,000, other branches represent but a small fraction of the total population. The same may be spoken by aboriginal tribes.

*Religions*—Two principal religions—Hindu and Mohammedan—account for about 92 per cent of the population. Of these,

the former claims more than 217,000,000, the latter, about 67,000,000. The Buddhists number some 11,000,000. Of Christians there are nearly 4,000,000. Jews number 21,000. *Commerce* Great Britain takes about 32.6 per cent of the exports and the United States about 10.6 per cent.

*Education*—The masses of the Indian populations are illiterate. Less than six persons out of every 100 have ever learned or are learning to read and write. Such as it is, education is distributed very unevenly among sexes, classes, and localities. According to the records of 1941 there were some 15,800,000 children at school, or about one-fifth of those who were of school-going age. Bombay owes its high position to the Parsis and the Brahmans, who attach the highest value to education. The most illiterate of all are the aborigines, found chiefly in the Central Provinces. Mohammedans, especially in the north, prefer the religious instruction given in their mosques to the more practical secular teachings of public schools. There are universities at Calcutta, Madras, Bombay, Punjab and Allahabad. There have numerous affiliated colleges, in which a higher education is given than at the schools. Normal schools for the training of teachers have been established. There are also medical technical schools, and a few art schools. In 1936 there were 115,000 students at universities and professional colleges. About 2 per cent were women.

*History—First Period*—During the earlier periods, the population of India appears to have been made up of four great races, distinguished by a difference of color. The earliest of these, it seems certain, was the black race or group of black races, speaking the languages called Dravidian and now inhabiting the peninsula of South India, called the Dekhan. The second race in primitive time was probably the yellow race, with Chinese affinities, whose remnants, driven to the hills, are the Santals of Bengal and the Savaras of Madras. The two remaining great races were the red Rajputs and the white Brahmans. The pure nucleus of the Brahmans is white, this color showing most clearly in the Brahman women, who are not exposed to the sun, just as the distinctly red color is most clearly seen in the Rajput women, for the same reason. In features, the Brahmans of the best type resemble the ancient Romans. Blue eyes are sometimes found

among them, especially the Brahmans of Kashmir.

At a period long anterior to Gautama Buddha (sixth century B.C.) a composite polity had been formed through an adjustment between these four races. It was called in Sanskrit *Chaturvarnyam* from the words *Chatu*, 'four,' and *Varna*, 'color,' that is, the system or polity of the Four Colors. Two principles underlay this complex polity. The first was the 'color line.' All possible barriers were put in the way of intermarriage between races of different color, and this was done so effectively that, while there has been race admixture, there remains a pure nucleus of each of the four at the present day. The second principle was that, in the composite state, each race should fulfill the function for which it was best fitted by race, genius and character. Therefore the red Rajputs, because of their martial valor, were the rulers and warriors. To the white Brahmans, with their high intellectual powers, were allotted scholarly and priestly duties. The yellow races, who, like their kinsmen in China, had a gift for agriculture, were the farmers. The black race, akin to the Negritos of the Malay peninsula and islands, and perhaps to the aborigines of Australia, but much more highly developed, were at first artisans, divided into classes according to the material in which they worked, gold, silver, bronze, iron, wood, and stone. Some of the most remarkable temples in South India, veritable sky-scrapers, 'built by giants and finished by jewelers,' appear to represent the work of the black race, or races.

Just as each of these four races made a contribution to the complex state, so each of them made a contribution to the complex religious system of ancient India. To begin with the oldest, the black races, they appear to have followed practices which, in the middle ages, would have been described as magic, and which the early 19th century might have classed with mesmerism, practices depending on a belief in personal magnetism, which might be directed by the will to produce good or evil effects, to heal or to harm. The yellow race, as in China, were spiritualists, believing in the continued presence of the ghosts of parents and ancestors as invisible members of the still undivided family, and seeking, by various means, including what would now be called mediums, to keep up unbroken in

tercourse with these spirits of the departed, and to obtain their counsel in all family problems

The white Brahmans, besides a very similar cult of the spirits of ancestors, had a theological system, expressed in an elaborate ritual, the chief features of which consisted of the thousand hymns which were later gathered in the ten 'circles' of the *Rig Veda*, these same hymns arranged in different ways also made up the *Sâma Veda* and the *Yajur Veda*, and the Brahmans were therefore called the 'men of the three Vedas' It is of high interest that not only the most characteristic principles of ancient India's religion—the twin doctrines of spiritual liberation and of reincarnation through the bondage of works—appear to have been contributed by the red Rajputs, but also from the same race, and not from the white Brahmans, came the heroic figures of Indian religious history, the great avatars, or divine incarnations, like Rama, the hero of the Ramayana, Krishna, the hero of the Mahabharata, and Prince Siddhartha, better known as Gautama Buddha. It is significant, also, that the great religious movement of which Krishna was the central figure, and which finds its best expression in the *Bhagavad Gita*, was in fact a revival of the great twin teachings of the far older Upanishads: the teaching of spiritual liberation, or Nirvana, and the teaching of reincarnation through the bondage of works. Thus Krishna is made to declare, in the *Bhagavad Gita*: 'Many are my past births, O Arjuna, and also thine, mine I know, but thine thou knowest not' The name, and the idea, of Nirvana is found throughout the *Bhagavad Gita*, the idea, not of annihilation, but of full consciousness and immortal splendor.

The true significance of the religious movement of the sixth century before our era, of which the Rajput prince Siddhartha, known as Gautama Buddha, was the central, heroic figure, would, therefore, appear to be, that it was a second revolt, precisely like that of the Rajput Krishna, against the priestly tyranny of the Brahmans. For centuries the disciples of the Buddha fought against the priestly tyranny of the Brahmans, and gained royal converts like the great King Asoka, but the Brahmans finally triumphed and drove the Buddhists beyond the confines of India, to China, Burma, and Tibet, fastening upon India the deadening spiritual tyranny of priest-craft and super-

stition which, more even than the Moslem conquest, was the cause of India's moral eclipse through centuries, an eclipse which has so long hidden the glories of her splendid past.

**Buddhist Period**—From B.C. 259, when the Mauryan king Asoka was crowned at Pataliputra, we begin to fit together a skeleton of history from relics in stone, earth, or clay, and from tables, inscriptions, and coins collected and arranged by European research. Asoka's pillars and rock inscriptions (B.C. 253-251) indicate the far reach of his rule. His edicts prohibit the sacrifice of animals, order medical relief for man and beast, enjoin the planting of trees and sinking of wells, dwell with satisfaction on the peace and prosperity which prevail, and preach the virtues of liberality, piety, and religious toleration. They excite our interest in the state of India, but leave it unsatisfied. Architectural remains supply lists of dynasties, and nothing more. The numismatist's shovel disinters coins which tell the tragedy of vanished empire, but give no details of its rise and fall. The Mauryan rulers at Magadha claim our main interest. From about 300 B.C. to the 5th century A.D. they maintained their authority. But other dynasties assert claims to a pre-eminence which no historic facts can prove or refute. Real history, in fact, remains a blank until the lurid light of Mahmud's destructive expeditions falls upon its pages.

**Mohammedan Period**—We are now upon firmer ground, and from A.D. 1001 onwards there is abundance of material for history. Kings wrote memoirs, foreign visitors were entertained, and literary men were patronized and assisted. Between 1001 and the conquest of Delhi by Baber (1527) four kings claim special attention—Mahmud, Shabab-ud-din, Ala-ud-din, and Mohammed Tughlak, Mahmud's grandfather, a Turk slave, founded the dynasty of Ghazni. A.D. 961 Mahmud led a succession of expeditions against the Indian principalities, carrying the spoils to Ghazni (1024). In 1176, Shabab-ud-din, though he failed to subdue the Rajputs, brought under his sway Gujarat, Gwalior, Bengal, and the whole of Hindustan except Malwa. On his death (1206) Hindustan became detached from Afghanistan, and upon this unhappy country the stress and storm of the Moguls fell. Kutb-ud-din, whom Shabab-ud-din had left in command of his Indian forces, became king

of Delhi, and founded the line of slave kings who ruled from 1206 till 1288. The Turk house of Khilji (1288-1321) held the Mogul invaders in check, and the most famous of that line, Ala-ud-din (1295-1316), extended his sway down even to Madras. Thus the succeeding Tughlak dynasty (1321-99) held rule over a larger kingdom than had ever come under one crown, until the mad freaks of Mohammed Tughlak broke it into pieces. His projects of foreign conquest in the direction of China and Persia ended disastrously, impoverishing his treasury, and letting loose upon his defenceless subjects a host of unpaid soldiery. A vivid description of the desolation and disorder which prevailed is given by Ibn Batuta.

Baber acquired Kabul in 1504, and invaded the Punjab, claiming it as part of the heritage of Tamerlane. In 1524 he gained a victory at Lahore, and two years later he defeated Ibrahim Lodi near Panipat, and occupied Delhi and Agra, ruthlessly putting to the sword all who dared to oppose him. Step by step he won back the revolted provinces of Gwalior, Mewar, Chondri, and Bengal, but died at Agra (1530), in the midst of family quarrels and intrigues. His son and successor, Humayun, commenced a disastrous reign by resigning Kabul and the Punjab to his brother Camran. He then invaded Gujarat, and had just taken Champaner when tidings of the rebellion of Shih Khan in Behar reached him. Returning to deal with this outbreak, he suffered a signal defeat at Kanauj (1540), and eventually fled to Amirkot (Umarkot). Later on he took refuge in Persia, then ruled by Shah Tasp, leaving Shih Khan to establish himself and his descendants of the Sur line on the throne of Delhi. Shortly afterwards, with the help of a Persian force, he captured Kabul and Kandahar, and invading the Punjab, had by 1555 recovered Lahore, Delhi, and Agra, when he met with an accident, and died before his general, Bairam Khan, had finally crushed the resistance of Sikandar Sur.

Akbar was only thirteen years of age when his father died, in 1556. Akbar, in 1560, took full command of the vessel of state. He died in 1605, having established an Indian empire not merely on the foundation of military force, but upon sound principles of civil administration. His spirit of religious toleration and his patronage of Sanskrit literature won the Hindus to his side, while his abolition of the *jizya*, or capitation tax on infid-

els, removed an irritation which was not merely one of taxation. His revenue system conferred upon the masses of the cultivators the benefit of a correct measurement of their lands, with a fixed proportion, one-third of the produce, payable to the state in money. The author of this reform was Todar Mul. The army was reformed, the forts of Agra and Allahabad erected, and many useful public works executed. Selim succeeded his father under the name of Jehangir, and reaped the fruits of his own unfilial conduct in the rebellion of his son Khusru, and later on in serious disagreements with another son, Shah Jehan.

Shah Jehan, the next emperor, was deposed by his son after a reign of thirty years. By his prudent administration he enriched India with various public works, among them being the splendid buildings of Delhi, with its peacock throne valued at \$32,000,000, and the mausoleum at Agra to his queen, now so widely known as the Taj Mahal. The long reign (1658-1707) of his successor, the bigoted and suspicious Aurangzib, was in every direction disastrous to the kingdom of Delhi. He disgusted the Rajput princes, and in the military operations which ensued they and their people suffered cruelties which they never forgot. The Hindu subjects of the empire were excluded from office, insulted by the reimposition of the *jizya*, and aggrieved by interference with their social and religious customs. The emperor died at Ahmednagar in 1707, leaving behind him universal discontent and desolation, and an empire crumbling to its fall. There followed a succession of ineffective rulers under whom the Mogul Empire continued the decadence begun in 1707.

**British Period.**—On Dec. 31, 1600, the London East India Company obtained a charter for the exclusive privilege of trading to all parts of Asia, Africa, and America beyond the Cape of Good Hope, eastward of the Straits of Magellan. In 1613 they established a factory at Surat under a *firman* granted by the emperor, that port being then the chief outlet from which the *haji* was made to Mecca, and other positions were occupied at Calicut and Masulipatam. In 1661 Bombay was made over by the Portuguese as part of the dowry of Catherine of Braganza, in 1668 it was given over to the East India Company, and in 1685 the headquarters of the British traders were transferred thither from Surat. In 1689 permission was given by Aurangzib's officers for the

purchase of the site of Calcutta, and in 1715 Bengal became a separate presidency. The year 1698 was a turning-point in the history of the London company. The state wanted a loan of two millions, and, as an inducement, the subscribers were allowed to convert their shares into a joint stock under the name of the English East India Company. William III granted a charter and the celebrated court of directors and general court of proprietors were then constituted. In 1708 the London company and the English company combined under the title of the United East India Company.

Extensions of its charter were from time to time obtained, and when, in 1765, Shāh Alam added the diwān, progress was rapid. The battle of Plassey in 1757 had ensured military supremacy. The company now took over the financial control, leaving the judicial administration with the British. But the misery and disorganization which the occurrence of famine brought to light compelled them in 1772, to exchange commerce for territorial sovereignty. The Regulating Act of 1773 provided the machinery of government needed for this revolution, and under it Warren Hastings, the first governor-general of Fort William in Bengal, took his seat in council on Oct. 20, 1774. Pitt's Act of 1784 established the control of the board of commissioners for the affairs of India. In 1813 trade was thrown open to licensed persons, and 'the undoubted sovereignty of the crown' over the territories acquired in India was reserved, possession of those territories was, by a special act, guaranteed for a term of twenty years. The Charter Act of 1833, which sanctioned possession for a further period of twenty years, recognized the imperial character of the company's rule by appointing Lord William Bentinck, then governor-general of Bengal, to be governor-general of India. On the suppression of the mutiny of 1857, the powers and territories of the company were transferred to the crown by the Act for the Better Government of India, 1858, and at the same time the Secretary of State's Council was created. In 1860 the separate European army of India was abolished, and in 1877 Empress of India was added to the older titles of Queen Victoria. See MUTINY, INDIA.

During 1876-78 a terrible famine ravaged Bombay, Madras and Mysore, in the course of which about 5,000,000 human beings perished. The Marquess of Ripon succeeded to the viceroyalty in 1880, armed with instructions to reverse the Afghan policy of Lyt-

ton. During his term, which was remarkably peaceful, Ripon introduced a less autocratic note into the public administration, besides inaugurating useful reforms. The period 1884-1899 was marked by wars, annexation of territory, definitions of boundaries and a siege of plague and famine. Lord Curzon became viceroy in 1899, a man of immense energy, aggressive, and with a wide experience of government, politics, and Near East and Far East problems gathered by travel. Curzon remodelled his predecessors' frontier policies—a source of chronic disturbance, he appointed commissions of inquiry on irrigation, railways, agricultural banks, education, police, taxation, usury and famine codes. Reforms were introduced in every department affecting the public welfare, Curzon toured the Indian Empire, inspecting, noting, holding converse with princes and officials, composing voluminous reports at night for the home government. In 1902 Lord Kitchener came to India as commander-in-chief. It was perhaps inevitable that two such powerful personalities like Curzon and Kitchener should clash. Curzon's resignation came in 1905, shortly after he had been appointed for a second term.

Altogether, Lord Curzon's administration was rich in achievements, legislative, political and social. The Earl of Minto succeeded Curzon in 1905. For some years the Bengali agitation held the political stage, which led to a Seditious Meetings Act in 1907. In this period, too, there began a more openly-expressed dissatisfaction with British rule, the aims of the reformers or nationalists varying from local self-government to complete independence for India. In his Indian Budget speech in the House of Commons in 1907, Mr John Morley foreshadowed important reforms in Indian administration, designed to associate the people more closely with the government. He nominated two Indian members to his own Council, and an Indian member to the Viceroy's Council. In 1908, to mark the 50th anniversary of the transfer of India from the Company of the Crown, King Edward VII, in a message to the princes and peoples of India reviewed the progress made during the half century, and promised an extension of self-government. In 1909 Viscount Morley designed to further native representation, known as the Morley-Minto Reforms of 1909, which were epochal in their way, but did not go far enough. Important and influential classes among the Indians were learning to realize their own position

and to estimate their own capacities, they compared their claims for equality of citizenship with those of the British race—India was developing a national self-consciousness.

Those intangible, but mighty forces which had compelled the introduction of these reforms continued to gain in intensity and volume, the demand of educated Indians for a larger share in the government of their country grew year by year more insistent, and this demand could find no adequate satisfaction within the framework of the Morley-Minto Constitution. The ultimate decision rested in all cases with the Government, and the Councils were left with no functions save that of criticism. The magnificent Durbar at which King George V in person was proclaimed and crowned Emperor (Dec 12, 1911), was notable for the announcement of the change of the imperial capital from Calcutta to Delhi, which was made an imperial district similar to the District of Columbia. Viceroy Hardinge took formal possession of the new headquarters at Delhi in December, 1912. The State entry was marred by an attempt on his life. When the World War came in 1914, a remarkable and unexpected outburst of loyalty and devotion to the King-Emperor was manifested by the princes and peoples of India. The country was almost denuded of British troops and even of native soldiers, yet there was no general uprising against the British, as had been predicted.

Lord Hardinge's viceregal term was extended to March, 1916. One of his last official acts was to put forward Government proposals for post-war constitutional reforms. Lord Chelmsford's first year in office, 1916, was marked by alarming symptoms of unrest and increasing agitation for constitutional changes toward 'Home Rule for India'. The British Parliament in December, 1919, passed the Government of India bill, dividing political power between the native population and the Indian Civil Service. The Report explicitly stated that when India was ready for it, thoroughly representative government would follow. During 1918-1919 conditions were exceedingly serious, drought brought a failure of crops and a resulting famine. Then the great pandemic of influenza carried off a huge number of Indians, estimated at between seven and twelve millions. Throughout India the radical Nationalists grew increasingly aggressive, rioting and seditious activity so spread that the British authorities deemed it nec-

essary to appoint a special committee to investigate and consider the whole situation. Serious disturbances in the Punjab and Delhi, resulting in many deaths, followed on a 'passive resistance' movement, inaugurated by Mahatma Gandhi, against the Rowlatt measures. Opposition to them was intense, and for months rioting and terrorism spread over the country, and reached its climax in what the Indians call the Amritsar Massacre when troops fired into a seditious mass meeting, killing nearly 400 and wounding 1,500 persons, April 13, 1919.

A British investigation of this tragedy condemned the action of the officer in command, General Dyer, and he was recalled from India. One of the most important—and later the most powerful of all—of the implacable foes against British rule at this period was Mahatma Gandhi, from 1919



*Mahatma Gandhi*

leader of the Nationalists, a follower of Tolstoy, and an advocate of non-co-operation and passive resistance, and absolute boycott of the British government being his road to the independence of India. The Prince of Wales visited India in November, 1921, staying four months. Though his tour did much to restore goodwill among the natives, it was marred in some parts by the Non-co-operation Party, comprised of Gandhi's followers. Responsible opinion had become alarmed at the paralyzing results of this non-co-operation when, on February 14, 1922, at Chauri Chaura in the United Provinces, 21 policemen and watchmen were murdered by a mob of 'volunteers'. A strike on



the East Indian Railway complicated matters and forced drastic measures. Gandhi was arrested in March, he pleaded guilty at his trial for civil disobedience and was sentenced to six years' imprisonment. He served less than two years of the sentence and was liberated unconditionally in January, 1924. In 1925 he announced his intention to retire into seclusion for a year. In addition to his independence for India activities, Gandhi also attempted to unite Hindus and Moslems by an alliance of the National Congress with the Moslem League. In 1937 he continued his policy of passive resistance.

Lord Irwin succeeded Lord Reading as Viceroy in April, 1926. During the year steps were taken to stamp out slavery in Burma, the slave liberation scheme in Nepal, formulated by the prime minister of that state, was completed at a cost of 275,000 pounds sterling, while slavery was also abolished in the state of Khat, Baluchistan. In 1928 the historic 'Simon Commission' arrived in India to report to what extent it was desirable to establish the principles of responsible government in India, or to extend, modify or restrict the degree of responsible government. The commissioners spent many months travelling about, taking evidence from representatives of all the chief communes and interests concerned, excepting only those Nationalists who refused to cooperate. An unanimous Report was issued in 1930. Briefly summarized, the recommendations included the grant of the utmost possible measure of independence to local governments within their own sphere, and the substitution in the Central Government, which should continue to deal with matters affecting British India as a whole (defence problems, foreign relations, communications, tariffs, etc.), of a Federal system in place of the existing arrangements for which no exact parallel could be found elsewhere in the Empire. Measures were also proposed whereby representatives of the Indian States would join with representatives of British India for the discussion of matters of common concern in a 'Council of Greater India' to be appointed by Royal Proclamation. Constitutionally, this last recommendation is an innovation from which the most far-reaching consequences may ensue. The Commission insisted that the Constitution to be framed should be such as would not require to be revised and overhauled by external authority at stated intervals, but should contain within itself provision for adaptation by a

process of natural growth, to meet new circumstances and changing conditions. The ideal of an All-India Federation was held up as one to be attained by degrees as the Feudatory States came to realize the desirability of entering into closer political relations with British India. As a preparatory step toward that object, the reconstruction of British India on a federal basis was advocated.

In March, 1930, Gandhi started another 'civil disobedience' campaign by leading a band of 80 followers to the Gulf of Cambay. The march took 24 days, and its object was to dip up sea water and make free salt in defiance of the government monopoly and thus evade the salt tax revenue. The party was unmolested, but some riots developed in April when other villagers also made salt and the police interfered. On April 1, 1930, a new law came into effect, forbidding the marriage of children under the age of 14. This measure, also, aroused protests from Hindu orthodox. An event of tremendous historic importance was witnessed in London on Nov. 12, 1930, when an Indian 'Round Table Conference' was opened. For the first time a delegation of some eighty Indians, representing all races and religions and classes in India (except the Congress party) sat round a table with a delegation representing all parties and both Houses of the British Parliament to discuss, on a basis of complete equality and with nothing excluded from the purview of the Conference, what the future of Indian government should be.

The Government of India Act was passed in 1935. It provided for a new federation system designed to secure a broad measure of home rule for India. In March 1942 Sir Stafford Cripps bore to India Britain's offer of immediate Dominion status and the option of full independence after the war. The Indian Congress rejected the offer. In 1946, Britain announced that India would have complete independence by 1948. In interim all Indian government, appointed in 1946 was headed by Nehru (q.v.), Congress Party leader.

On August 15, 1947, Britain's 200 year rule over India was surrendered. The two new nations which were established, the Union of India and Pakistan became Dominions in the British Commonwealth. The Union of India includes the provinces with a Hindu majority and most of the 563 native states. In the Union are most of the large cities and industrial centers. Lord Mountbatten, last Viceroy of India, became Governor General of the

Union, first Premier and Foreign Minister was Jawaharlal Nehru. Area, ab 1,200,000 sq m, p ab 300,000,000, capital, New Delhi, p ab 95,000. Pakistan includes the predominant Moslem provinces and a few native states, and is primarily an agricultural region. Mohammed Ali Jinnah, leader of the Constituent Assembly and president of the Moslem League was the first Governor General. Area, 300,000 sq m, p ab 100,000,000, capital Karachi, p 350,000.

Consult Lord Curzon's *British Government in India* (1925), Andrews' *Mahatma Gandhi's Ideas* (1929), Thompson's *Reconstructing India* (1930), Dumbell's *Loyal India: A Survey of 70 Years* (1930), Saund's *My Mother India* (1930), John Gunther, *Inside Asia* (1939), Parkin's *India Today* (1946).

**India, French**, comprises Chandarnagor (near Calcutta), and Karikal, Mahe, Pondicherry, and Yanaon in the Madras Presidency.

French India was administered by a governor-general until 1947, when it was organized into five free cities, locally governed, within the French Union.

**History**—The proximity of Pondicherry to Madras brought the French and English trading companies into collision, and during the eighteenth century the settlement was several times captured by the English. Between 1803 and 1814 all the French settlements in India passed into English hands, but they were restored in 1814-15 on condition that they were left unfortified.

**India, Native States of**, a term including all the states and principalities of India administered by native rulers, formerly under the suzerainty of the British India Government. Of the 56 Native States, the majority joined the Union of India when India was partitioned in 1947, a few decided to be included in Pakistan. The chief Native States are Hyderabad, Baroda, Mysore, Kashmir, Rajputana, Central India, Bombay States, Madras States, Central Provinces States, Bengal Provinces States, Bengal States, United Provinces States, Punjab States, Baluchistan, Sikkim and N W Frontier. In the larger states the native rulers are practically absolute. In others British influence has brought about marked progress in law, education, finance, and internal improvements.

**India, Portuguese**, consists of the territories of Goa, Diu, and Damao. Rice, coconuts, and spices are raised, there are salt works in all the territories, and manganese is mined in Goa. Portuguese India constitutes a

province, and is administered by a governor-general with headquarters at Panjim, or New Goa, the capital.

**Indiana**, popularly called 'The Hoosier State,' one of the North Central States of the United States.

**Topography**—Indiana is in the valley of the Mississippi River and in the basin of the Great Lakes. It is partly in the great central prairie and for the most part has an undulating surface, sloping southwestward. Drainage is chiefly through the Wabash River and its main tributaries.

**Mining**—Indiana ranks well up among the States in the value of mineral products, and first among the States in the value of the limestone industry and sixth in coal production. Coal mining is the leading mineral industry of the State. The limestone industry ranks second in importance. About 70 per cent of the limestone used for building in the United States comes from Indiana.

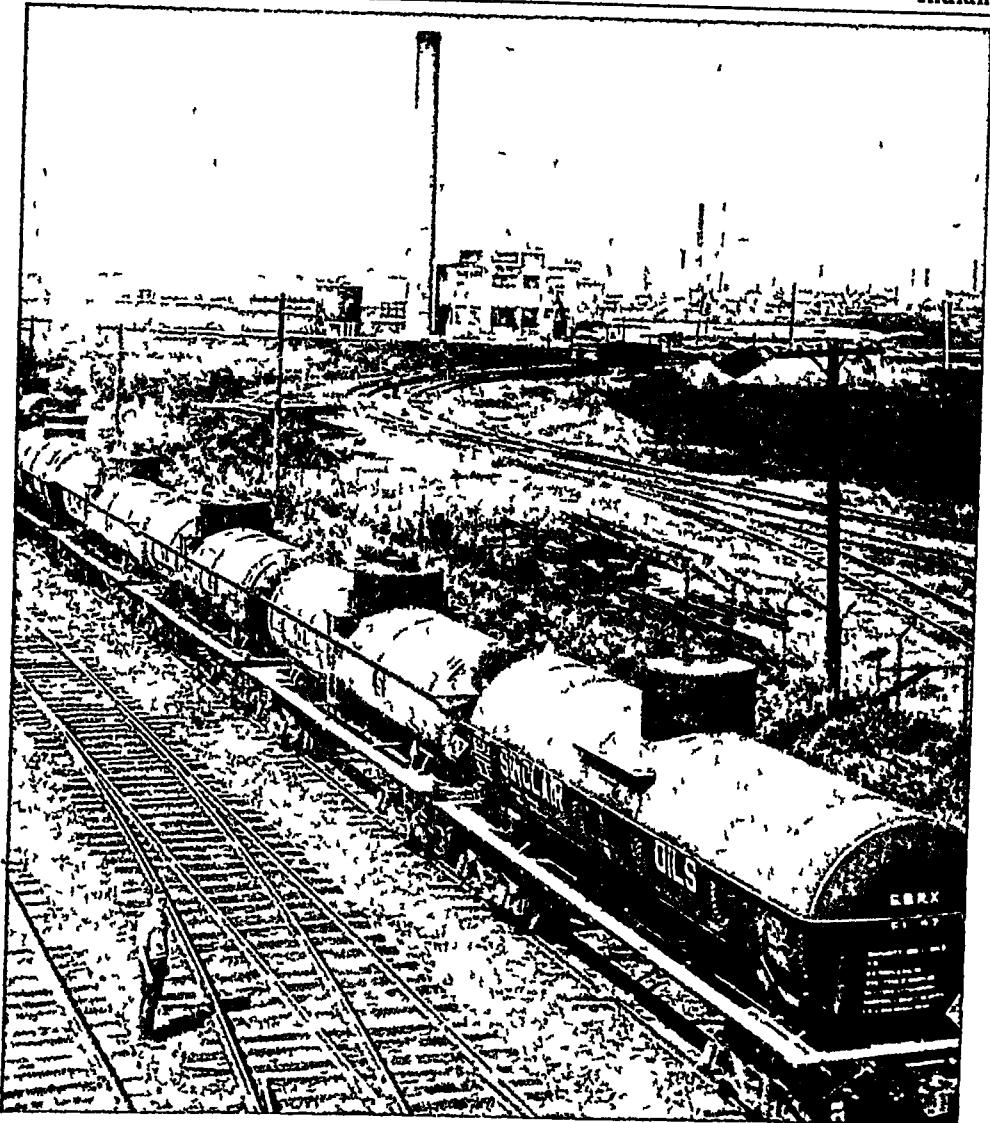
**Forestry**—Indiana has declined in importance as a lumber producing State, and tree planting has been resorted to. The State is noted for having one of the largest State forest nurseries west of the Allegheny Mountains.

Agriculture is one of the most important industries in Indiana. The chief crops are corn, oats, wheat, rye, hay, and tobacco. Fruits are also raised.

Stock raising, including cattle, horses and colts, swine, and mules, is also carried on extensively.

**Manufactures**—Indiana showed a wonderful increase in manufactures up to the second decade of the 20th century. An abundant supply of timber, important agricultural products, and a large output of petroleum and natural gas were factors which brought about this growth. The falling off of supplies of these natural resources in recent years has hurt the industries depending on them, but manufacturing has nevertheless continued to grow, lumber being shipped in from outside the State to supplement the local supply, while the increasing amount of coal mined has compensated largely for the smaller supply of natural gas and stimulated other lines of manufacturing. Iron and steel, steel works, and rolling mills constitute the most important industry.

**Population**—According to the U S Census for 1940 the population of Indiana was 3,427,796. Of this total, foreign-born whites numbered 133,889, Negroes, 92,873, Asiatics, 458, and Indians, 285. The urban population, in towns and cities of at least 2,500 inhabitants,



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#### Indiana

Great oil refinery at East Chicago, showing the cars in which the oil is shipped to the consuming public. This refinery is situated at the eastern end of a pipe line, recently laid, from the Oklahoma and Kansas fields.

constitutes 55.1 per cent of the total. The population of the principal cities in 1940 was Indianapolis, 386,972, Fort Wayne, 118,410, South Bend, 101,268, Evansville, 97,062, Gary, 111,719, Hammond, 70,184, Terre Haute, 62,693, East Chicago, 54,637, Muncie, 49,720, Anderson, 41,572, Kokomo, 33,795, Elkhart, 33,434.

**Education**—Administration of education is vested in a State Superintendent of Public Instruction. In the academic year, 1940-1, there

was an enrollment of 700,000 pupils in the public schools, and the public school expenditure was \$65,000,000. The average teacher's salary was \$1,224. Continuing the consolidation of small schools into larger ones, a reduction of 159 was effected. The State provides for the instruction of teachers in the State Normal School, the western being at Terre Haute and the eastern at Muncie.

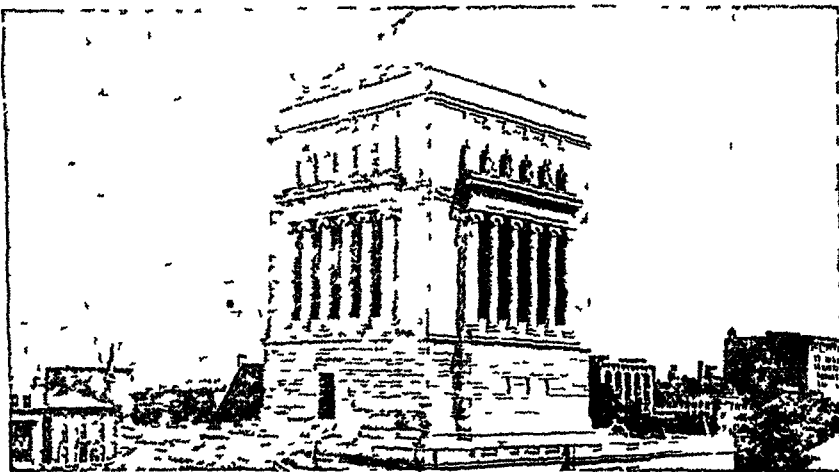
The institutions of higher learning supported by the State are Indiana University at Bloom-

ington, and Purdue University, a school of technology at Lafayette. Other institutions of higher learning include De Pauw University, at Greencastle, Notre Dame University, near South Bend, Earlham College, at Earlham.

**Charities and Corrections**—In 1933 by act of Legislature the Board of State Charities was replaced by eight newly-created government units to which the Governor transferred the duties of the former Board. Under this arrangement was established a Department of Public Welfare under the direction of the Governor, which was in charge of all welfare work. The state maintains 20 charitable and correc-

La Salle crossed the portage from the St Joseph to the Kankakee River. In 1702 the French built a fort at Vincennes, and soon after made the first permanent settlement. Through the expedition of the Virginians under George R. Clarke, in 1778-9, the region w of Ohio and n of the Ohio River, known as the 'Illinois country,' was conquered for Virginia. This region, ceded in 1783 to the United States, four years later became part of Northwest Territory under the Ordinance of 1787.

Agitation for slavery by many early settlers from across the Ohio began previous to ad-



*Indianapolis World War I Memorial*

tional institutions, and also has an old age Pension Law which went into effect in January, 1934.

**Government**—The present constitution of Indiana was ratified in 1851. The legislature is composed of the Senate, limited to 50 members, and the House of Representatives, limited to 100 members. Senators are chosen for four years, and Representatives for two years. Regular sessions are held every two years, and are limited to 61 days.

The chief executive officers are the Governor and Lieutenant-Governor, chosen for four years, the Secretary of State for two years, Attorney-General for four years, and the Superintendent of Education, Auditor, and Treasurer, for two years. Under the Reapportionment Act, Indiana has 11 Representatives in Congress. Indianapolis is the State capital.

**History**—The first white persons to enter the present limits of Indiana were French explorers and traders. In the winter of 1679-80

mission into the Union in 1816. But the first constitutional convention carried out the spirit of the Ordinance of 1787 by prohibiting slavery. An era of wild speculation in lands culminated in 1837 in general bankruptcy and a State debt of \$14,000,000. The development of coal deposits about 1870 and the discovery of natural gas in 1885, greatly stimulated the industries of the State. See WPA Writers' Project, *Indiana* (1941).

Indiana, borough, Pennsylvania, county seat of Indiana co 45 m n e of Pittsburgh. It is a trading center of a bituminous coal region, p 10,050.

**Indian Affairs**, U S Bureau of, a division of the Department of the Interior, established in 1832 as a division of the War Department, in 1849 was transferred to the Interior Department. The Bureau has charge of the lands, moneys, schools, purchase of supplies, and welfare of the Indians of the United States, exclusive of Alaska. At its head is a

commissioner, appointed by the President, and aided by agents who supervise intercourse among the Indians. Administrative and statistical Reports of the work of the Bureau are issued annually.

**Indianapolis**, city, Indiana, capital and largest city of the State and county seat of Marion co. One of America's largest inland cities, it is nevertheless a city of homes and is noteworthy in that there is comparatively little extreme wealth or poverty. The Soldiers' and Sailors' Monument, a superb memorial with a shaft 285 feet high, surmounted by a bronze figure representing 'Indiana Triumphant' commemorates Indiana's part in the wars of the Union.

The larger manufactures in order of output are slaughtering and meat-packing, motor vehicles including bodies and parts, foundry and machine shop products, printing and publishing, bread and bakery products, canning and preserving, furniture, car construction and steam railroad repairs, paints and varnishes, butter, men's work clothing, concrete products, boxes (paper and other), confectionery, lumber and timber products, planing mill products, brass, bronze, and other nonferrous alloys, and manufactures of these alloys and of copper, ice cream, ice, perfumes and cosmetics, stoves and ranges, structural and ornamental iron and steel work, and beverages. Indianapolis is the shipping, jobbing, and retail center of the State.

In 1821 Indianapolis received its name, and on Jan. 1, 1825 became the capital of the State, when the seat of government was moved from Corydon. In 1847 it was incorporated as a city, p. 386,972.

**Indian or Malay Archipelago**. See **East Indies**.

**Indian Architecture**. The history of Indian architecture dates from the reign of Asoka (272-236 B.C.), who established Buddhism as the state religion of India. The earliest monuments yet discovered are a series of columns erected by him to commemorate the doctrines of Buddha. The sacred buildings of Buddhism may be considered in two classes—the *topes*, or *stupas*, and the *chhatras*, or temples. The *topes* are mound-like erections, rising from a low circular wall, and containing in the centre or at the top a small chamber for the preservation of the relics of some saint. Of the temples, or *chhatras*, only rock-cut examples now exist.

The early Buddhist style was followed by that of the Jaina (A.D. 100-1300), which extended over the whole of India from the Him-

alayas to Cape Comorin. While this style seems to have taken many of its features from some older non-Buddhist style, it lacks the vigor and boldness of the Buddhist, but far surpasses it in delicacy of detail.

Partly contemporaneous with the Jaina is the Hindu or Brahmanical style. It may be divided into three branches: (1) the Northern Hindu, A.D. 600 to the present time, (2) the Chalukyan, or Central Indian, 1000-A.D. 1300, (3) the Dravidian, or Southern Indian, A.D. 1350-1750. All three styles have the small shrine and portico, and the excessive richness of carving and sculpture, of the Jaina style. The great temple at Orissa (A.D. 617-637) is a fine example of the northern style.

A fourth style of Indian architecture is the Indo-Saracenic, which may be divided into two parts, the Pathan and the Mogul. It begins with the 11th century, and ends with the 15th. The later Pathan style was based on northern models. Plainness and grandeur are its characteristics. The dome, the arch, the minaret are nobly developed.

The Mogul style began with Akbar the Great in the 14th century. At first it appeared in a somewhat Hinduized form, but it soon became purified from a Moslem point of view, and resumed the severe simplicity and grandeur of the later Pathan style, superadding thereto a grace and dignity never surpassed in human art. At first the materials were red sandstone and marble intermixed. But by degrees marble was used more and more, till the culminating example of this style, the Taj Mahal at Agra, was encased entirely with this material, inlaid with precious and parti-colored stones. After this the Pearl mosque (marble) at Agra and the palace fortresses at Agra and Delhi, and the Jama mosques at Delhi and Lahore (Punjab) are the most renowned examples. None of the Indian styles has influenced European architecture unless we except the buildings erected by Emmanuel of Portugal (1495-1521) at Tromar and Batalha in Portugal, shortly after the Portuguese settlement in India.

**Indian Education**. The first appropriation by the U. S. Government for Indian education was \$500 voted to Dartmouth College in 1775. Beginning in 1819 the various religious denominations took an active interest in Indian education and persuaded the National Government to grant financial aid to the schools which they were establishing. In 1873 reservation boarding and day schools were first established by the Government. In 1882 a

Superintendent of Indian Schools was appointed, and some years later a force of travelling supervisors

The earlier Indian education was literary and religious in character, but in recent years much more has been made of industrial or vocational education

During the past few years there has been considerable change in Indian education. A policy now well-established is the substitution of Federal day schools and public-school facilities for Government Indian boarding schools. In 1933 this was carried even further because of necessary economy in Government expenses \$500,000 was shifted from boarding schools to day schools. By this shift twice as many Indian children were provided with an education of a better quality than had been in the boarding schools. Nearly 60,000 Indian children are now attending public schools and Federal day schools.

**Indiana University**, a non-secretarian co-educational State institution at Bloomington, Ind., established as Indiana Seminary in 1820, the university charter dating from 1838. It has a College of Liberal Arts (1828), Schools of Law (1842), Medicine (1903), Graduate School (1904), and Education (1908), and a Summer School. There is no charge for tuition, except in the School of Medicine.

**Indian National Congress**, a meeting of delegates representing the natives of India, held annually, to discuss the political claims and grievances of the native population, and to consider the attainment by any constitutional means of a system of self-government in India similar to that enjoyed by other British Colonies.

**Indian Ocean**, one of the five great oceanic divisions of the globe, stretches from Africa eastward to the East Indies and Australia, and from Asia southward approximately to the Antarctic Ocean. Its area is estimated as about 27,500,000 sq. m. During the summer months, the southwestern monsoon blows steadily toward the continent of Africa. Although in great part a fairly tranquil region, this ocean is sometimes visited, especially at the changes of the monsoons, by violent hurricanes.

The Indian Ocean is fed by several large rivers, notably the Indus, Ganges, Brahmaputra, Irrawadi, Salwin, and the Tigris-Euphrates on the north, and by the Zambezi and Limpopo on the west. Deep-sea investigations do not favor the existence of the fabled continent of Lemuria, reported to have been the cradle of the human race.

**Indian Pipe** (*Monotropa uniflora*), a low growing parasitic plant which attaches itself to roots or to decomposing vegetable matter, native to Asia and the United States. It is waxy white in color but turns black on dying. It has a solitary nodding flower.

**Indian Plantain** (*Cacalia*), a genus of tall perennial herbs of the Eastern and Middle United States.

**Indian Poke**, or **White Hellebore** (*Veratrum viride*), a hardy perennial with large broad leaves and yellowish green flowers, growing in swamps and marshy ground from Canada to North Carolina.

**Indian Reservations**. See **United States Indians**.

**Indian River**, a long narrow lagoon on the east coast of Florida. On its banks are numerous popular winter resorts. The region is famous for its oranges.

**Indians, American**. See **American Indians**.

**Indian Summer**, a period of delightful weather, characterized by a hazy atmosphere with dry fog, and by greater warmth than the period immediately preceding, occurring in some parts of the United States generally in November or early December.

**Indican**,  $C_{15}H_{15}O_6N$ , the glucoside of indigo or leucindigo occurring in woad and various other plants. The name indican is also applied to potassium indoxyl-sulphate, which is a normal constituent of urine. Its presence in excessive amounts—indicanuria—is observed in chronic constipation, intestinal indigestion, epilepsy, and neurasthenia.

**Indicator**, in engineering, an instrument for studying the behavior of the steam in an engine cylinder. It was invented by Watt for studying the working of his engine. A diagram traced by the instrument on a small sheet of paper, called the indicator diagram or card, supplies the desired information.

An area whose average height is proportional to a force and whose length is proportional to a distance, is itself proportional to the work of the force exerted through the distance. This is what the indicator card shows for one stroke of a piston. The force is the average steam pressure, and the distance is the stroke length.

The Crosby indicator, illustrated in Fig. 1, is especially suitable for use on high-speed engines, the moving parts being very light, so as to minimize as far as possible the errors due to inertia. It comprises first a small cylinder containing a nicely fitting piston, which should work with little friction. The piston,



and shorter curved pods. The plants are easily cultivated, requiring a rich well-watered soil. The plants are extremely hardy and if neglected will propagate themselves as weeds.

To prepare the dye the leaves and stems of the plants are pressed into stone tanks and allowed to soak in water for about 12 hours. Fermentation soon commences, causing a rise in temperature, the indican is decomposed to a soluble, colorless compound, 'indigo white,' with the formation of a yellow liquid, which is run off and agitated with air.

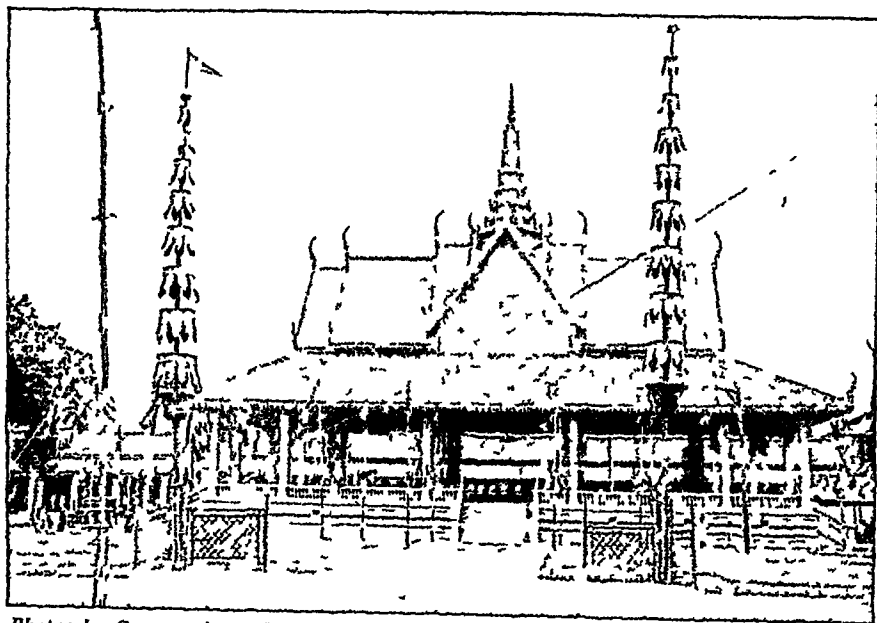
As thus prepared, indigo is a deep blue solid that consists chiefly of indigo blue (average

perennial herbs of the genus *Baptisia*, of the Eastern and Middle United States.

**Indigo Bird**, or more correctly **Indigo Bunting** (*Cyanospiza cyanea*), a small finch of the Eastern United States. It breeds as far north as Canada but migrates to Central America.

**Indium** (In, 114), a rare element, occurring in certain zinc ores, and partaking in general of the properties of metals of the aluminum group.

**Individual**, a term used in the history of thought with two shades of meaning. In one, it signifies an indivisible unit or atomic thing,



Photos by Cowing, from Ewing Galloway, N. Y.

French Indo-China. The Audience Hall of the Royal Palace, at Phnom Penh, Cambodia.

45 per cent), with other coloring matters, ash, and moisture.

Natural indigo has now been largely supplanted by various synthetic blues. Since 1897 natural indigo cultivation has greatly declined, and at present a large percentage of indigo used is of the artificial variety. In 1923 the United States produced 28,347,259 pounds of indigo dye, 30 per cent of the total vat-dye production. Up to the time of World War I Germany had been the greatest producer of synthetic indigo, but in 1923 her output was only about 13 per cent of her pre-war production.

**Indigo, False**, a name given to several

in the other, that which is unique—a real existence with a distinctive nature of its own.

**Individualism**, a term used in political economy to indicate a system of society and industry in which all initiative is due to individuals, and all organization and association to their voluntary agreement. It is thus opposed to socialism or collectivism, and in it the interference and activity of the state are reduced to a minimum for the maintenance of order and the enforcing of contracts. In the existing industrial system there is a mixture, continually changing, of individual and collective principles.

**Indo-China**, or Farther India, a geo-



graphical term designating the easternmost of the three great Asiatic peninsulas. It extends over 1,000 mi. at its widest part, between the Bay of Bengal and the Tongking Gulf, and about 1,200 mi. from the Chinese frontier to Cape Cambodia, its southernmost point in the China Sea. The peninsula presents a remarkable degree of uniformity in its physical, biological, and ethnical relations. Fish and rice are everywhere the staple food of the inhabitants, most of whom belong to the southern branch of the Mongol division of mankind and speak monosyllabic-toned languages of the Indo-Chinese linguistic family.

**Indo-China, French**, the name applied to a part of the peninsula in the southeastern part of Asia comprising the states of Cochinchina, Tonkin, Annam, Cambodia, and Laos and the leased territory of Kwangchow. In 1936, France recognized the Viet Nam Republic as a free state within the Union.

Mineral resources consisting of coal, iron, zinc, manganese, copper and antimony, are considerable but have been exploited only to a small extent. Fishing is an important industry. The chief products are rice, cotton, tea, rubber, pepper, sugar, tobacco and coffee. The silk worm is indigenous in Tonkin, where there are thousands of acres of mulberry trees. The Governor-General is the supreme administrative and military authority, assisted by a Superior Council of 12 members.

The beginning of French influence in Southeast Asia may be traced to missionary efforts. These were begun in Siam in the 17th century, and from there spread to Tonkin and Annam. In 1882 the third republic resolved upon a highly aggressive policy, and from that year the French steadily pressed their conquests until they possessed all the country. It was occupied by Japan, 1941-45.

**Indol**,  $C_8H_7(NH)(CH)CH_3$ , or **Benzo-pynol**, a compound obtained by fusing proteids with caustic alkalis. It also occurs in feces, being formed in the large intestine, from the action of bacteria on proteins, in company with skatol, phenol, cresol, etc. Indol undergoes oxidation in the system, and appears in the urine as indican.

**Indoor Baseball**, a game differing but slightly from the outdoor game of baseball, and furnishing a popular gymnasium pastime in winter. It is said to have originated in Chicago in 1887, George W. Hancock and fellow members of the Farragut Boat Club being its sponsors.

**Indore**, feudatory state of the Central In-

dian Agency. The Bhil, a savage aboriginal tribe, inhabit the mountains, p. 1,151-578.

**Indore**, chief city and capital of the state of Indore. Features of interest are the residence for Central India, the massive granite palace of Holkar the founder of the dynasty, the cenotaphs of the Holkars, King Edward Hall, King Edward Hospital, p. 9, 691.

**Indorsement**, a term used broadly to mean anything written upon the back of a document but more exactly, the writing of the holder's name on a negotiable instrument as a preliminary to its transfer to another. In its broad sense, the term is in use in connection with variants of receipt, writs of summons, pleadings and bills of lading. More narrowly, it has to do with checks, notes and bills of exchange. The indorser of such an instrument becomes conditionally liable for its payment.

**Indra**, in Indian mythology, the god of heaven, of thunder, lightning, storm and rain. In Vedic hymns he is described as the relentless foe of drought and darkness and nearly a fourth of the hymns in the *Rig-Veda* are dedicated to him.

**Indri** (*Indris*) the largest of the lemurs. It is confined to Madagascar, and has large hind limbs, a short tail, vivid coloring, and diurnal habits. See *LEMURS*.

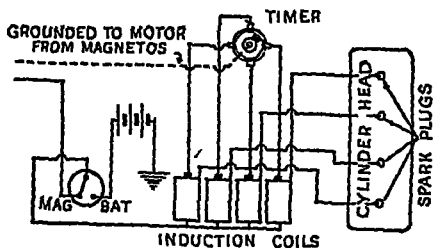
**Induction, Inductance**. See **Electricity, Current**.

**Induction**, the process of inference by which we pass from particular data to general principles or propositions, thus contrasted with deduction, in which we are said to apply general principles to particular cases. Induction is further distinguished as perfect or imperfect, according as the enumeration of the particular instances on which is based the general conclusion is or is not exhaustive. Such a view of induction, is, however inadequate, and the logic of modern science seeks to exhibit induction as a process of discovery and proof in which the character of the process, if properly carried out is a guarantee of the truth of the results. The third book of Mill's *Logic* is an elaborate analysis of induction from this point of view. See **DIRECTION, LOGIC**. Consult also, the standard works on Logic, as Fowler's *Logic* and Bosinquet's *Logic*.

**Induction**, in ecclesiastical usage, is the formality by which an Anglican archdeacon invests a clergyman with the temporalities of his benefice, usually by giving him the key of the church. In the United States, induction takes place, in the Presbyterian order, whenever a pastor takes a new charge. In general

usage, it means the installation in office or dignity of one elected or appointed

**Induction Coil**, a static transformer without an all-iron magnetic circuit. These coils are used in wireless telegraphy and telephony, electrotherapy, and wherever a small amount of energy is wanted at high potential. In its usual construction it consists of a long coil of thick wire in one to three layers, wound on a core of soft iron wires of the same length as the coil. Over this primary coil and well insulated from it, is wound the secondary coil, which contains a very large number of turns of fine wire. To operate, it is necessary to vary



Automobile Induction Coil

the magnetic flux of the core. As the induced  $\text{EMF}$  in the secondary winding depends on the rate at which the magnetic flux changes, the sharper the variation the greater the  $\text{EMF}$ . Common frequencies of alternating current lack sudden changes, so that a higher potential can be secured by breaking a direct-current circuit. If the current could be broken instantaneously, then the magnetic flux would decay at an infinitely great rate, and the  $\text{EMF}$  would use to infinity. However, the effect of self-induction in the primary winding is to generate in itself an  $\text{EMF}$  in the same direction as that impressed, which tends to keep the established current flowing so that the flux does not decrease with infinite rapidity, and infinite  $\text{EMF}$  in the secondary is not produced. By connecting the condenser  $\lambda$  as shown, across the terminals of the primary coil, the energy which would cause a spark at the interrupter is stored, making the break quicker than if the spark persisted. If the capacity of this condenser be too great, then the charging current will offset the clean break and give a slow change of flux and secondary  $\text{EMF}$ . The condenser discharge after the break gives a reversed current which is caused to persist, by the self-induction of the primary winding, until the condenser is charged in the reverse way. This continues until the magnetic energy stored on making

contact is frittered away in a series of rapid oscillations—which, however, produce a high potential in the secondary winding (See **ELECTRO-MAGNETIC WAVES**)

To produce periodic interruption of the current various devices are employed. The most usual pattern is the simple hammer vibrator. The current from the battery  $B$  passes to a screw  $I$ , then to the spring  $\pi$ . The fixed end of  $\pi$  is connected to the primary coil, and this again to the battery. On the back of  $\pi$  is a block or armature of iron, and this is attracted to the core when the latter is magnetized by the current. But the movement breaks the contact between  $I$  and  $\pi$ , the current ceases, and the spring returns to the screw. The same action is repeated continuously, resulting in a succession of interruptions. By adjusting the distance of the screw  $I$  and the strength of the spring  $\pi$ , the speed of interruption and the strength of the current can be regulated.

**Medical Coils**—The induction coils used for producing electric currents to be directly applied to the human body are much weaker and smaller than those for wireless telegraphy or for Röntgen ray tubes, and the same precautions are not necessary. The primary circuit interrupter is usually a simple hammer type, and the regulation of secondary  $\text{EMF}$  is performed by altering the number of wires in the iron core, by partially drawing the secondary coil off the primary, by altering the number of turns in the secondary by means of a switch, or by sliding a non-magnetic damper over the iron core.

Nicola Tesla designed a method of increasing the rapidity of oscillation of the currents in the primary circuit by using the spark discharge of the secondary coil to excite a second induction coil. Consult Bonney's *Induction Coils*, Ailsop's *Induction Coils and Coil Making*, Armagnat's *Induction Coils* (1908), Marshall and Stoye's *Induction Coils* (1908), Braymer and Roe's *Repair Shop Diagrams and Tables for Induction Motors* (1946).

**Induction Motor** See **Dynamo and Motor**

**Indulgence**, in Roman Catholic theology, means a remission, by church authority, of the temporal punishment which remains due after the sin and its eternal punishment have been remitted. By the discipline of the first centuries a severe course of penitential observance was exacted of all who fell into any grievous crime, especially apostasy, murder, and adultery. These penitential observances came to be considered as an expiation on the part of

the penitent for the temporal part of his punishment and some of the most acrimonious of the early controversies, the Montanist and the Novatian, arose as to the power of the Church to relax these penitential observances, and to admit sinners to communion. The name indulgence appears to have originated late, the first recorded instance of its use being by Alexander II, in the 11th century, but the institution is found in full development during the Crusades. Consult Lepicier's *Indulgences Their Origin, Nature, and Development* (1909), Paulus *Indulgences as a Social Factor in the Middle Ages* (1922).

**Indulgence, Declaration of**, proclaimed by James II of England, in 1687, promised to suspend all laws which tended to force the consciences of his subjects. The refusal of the Seven Bishops to command their clergy to read it from their pulpits was the culminating point of public dissatisfaction. Two similar indulgences in English history were those issued by Charles II in 1662 and 1672.

**Indus**, a southern constellation lying between Grus and Pavo, published by Bayer in 1603.

**Indus** (Sanskrit *Sindhu*), a river in India, which rises among the glaciers of the Kulas Mountains (19,796 ft) in Tibet. Its general course is at first toward the n.w., through Tibet and Kashmir, where it turns abruptly southward, between Gilgit and Hunza, and follows that direction right down to the sea. In the mountains the current is very rapid, it passes through deep, wild gorges (one near Iskardoh, in Northwestern Kashmir, having a depth of more than 10,000 ft), and is liable to tremendous floods. The value of the river for irrigation purposes is enormous, and the British government has carried out a series of works which have given rise to remarkable agricultural development in Sindh. The total length of the river is estimated at 1,800 m., and the area of its drainage basin at 372,700 sq. m.

**Industrial Commission**, a non-partisan commission appointed in accordance with an act of the U. S. Congress approved on June 18, 1898, 'to investigate questions pertaining to immigration, to labor, to agriculture, to manufacturing, and to business, and to report to Congress and to suggest such legislation as it may deem best upon these subjects.' It was also to 'furnish such information and suggest such laws as may be made a basis for uniform legislation by the various States of the Union, in order to harmonize conflicting interests, and to be equitable to the laborer,

the employer, the producer and the consumer.' The Commission was made up of five members each from the Senate, and the House of Representatives, and nine Presidential appointees. Its term was for two years, successively extended to Dec. 15, 1901, and Feb. 15, 1902.

**Industrial Corporations**. See **Trusts**.

**Industrial Education** includes all vocational education relating to the industries. In common usage, the term is not applied to professional training of the engineering schools or to manual training of the elementary schools, but to the field of specialized training lying between the two. In the first half of the 19th century some of the German states made attendance at continuation schools compulsory for those leaving the common schools, and later on instruction in these schools assumed a definite industrial character. Such schools are now organized in most German states, with highly specialized instruction bearing directly on the needs of particular trades and industries, and reaching, as they do, by far the larger proportion of all the young workers of Germany, they constitute the most important element in the German system of industrial education. Since the advent of the Hitler regime early in 1933 the schools, elementary, secondary and technical, as well as the higher institutions of learning, came under direct control of the state, and industrial education became a subject of first importance not only in technical schools but in all elementary and secondary schools.

In France the government developed through successive steps a type of school that builds on to the primary school, and aims to train artisans during a three-year course. These schools are known as *écoles pratiques du commerce et d'industrie*, and include institutions for girls as well as boys. Half of the school time is spent in practical shop work, devoted to cabinet making, carpentry, locksmithing, and machine building for boys, and dressmaking, tailoring, millinery, and cooking for girls. They are supported partly by the state and partly by the commune. Besides these schools, France possesses a number of highly efficient state schools for the training of foremen and superintendents for the mechanical industries.

In Great Britain the government makes great efforts to develop industrial education, aiming mainly at evening instruction in science, art, and technical subjects to meet the needs of young men engaged at the trades

The direction of this work is under the supervision of the Board of Education, through which body government aid is given to the schools by a system of grants based upon examinations. Such evening classes now exist in practically every industrial town throughout England and Wales, and provide instruction in almost every trade and industry.

Since the accession of the Bolsheviks, Communist Party, to power in November, 1917, it has been the object of the new rulers to transform backward agricultural Russia into an advanced industrial state. Many reforms were introduced in the educational system with that aim, but little headway was made until the inauguration of the Five-Year Plan in 1928. See RUSSIA. Since 1928 industrial education headed the curricula of all schools, including the elementary schools where manual training is combined with scholastic subjects. In the United States the continuous supply of skilled workmen through immigration, prior to World War I, made employers and the public indifferent to the needs of industrial training other than that afforded by the shop or factory. But with the supply of immigrants cut short by four years of war and by restriction on immigration in post-war years, the country became increasingly dependent upon the training of native talent in all fields of industrial endeavor.

The State of Massachusetts appointed a commission in 1906 to study the need of industrial and technical education, and it reported that the schools failed to prepare the youth for industry. Shortly after, the National Society for the Promotion of Industrial Education was founded and its agitation for the establishment of special technical schools and for the introduction of industrial education in the curricula of secondary schools was crowned with success. In 1917 the Federal Board for Vocational Education was created. In the same year, Feb. 23, the Smith-Hughes Act, known as the Federal Vocational Education Act, was approved. It enabled the Federal Government to embark upon a national policy of subsidizing vocational education.

According to Dr. L. V. Koss who was in charge of the three-year National Survey of Secondary Education, completed in 1932, the curriculum of the secondary school showed tendencies 'away from foreign languages and mathematics' and that 'fine arts and practical arts' claim 'from a third to two-fifths of the pupils' time'.

Due credit should be given to pioneer in-

stitutions in industrial education, under private auspices, such as Cooper Union, the Baron de Hirsch trade school, and the Mechanics' Institute of New York City, Franklin Union and Spring Garden Institute of Philadelphia, the Ohio Mechanics Institute of Cincinnati, and the Mechanics' Institute of Richmond, Va. See MANUAL TRAINING, TECHNICAL EDUCATION, VOCATIONAL EDUCATION.

**Industrial Legislation.** See **Factory Acts, Child Labor, Employers' Liability**.

**Industrial Relations, Court of,** a court created at a special session of the Kansas legislature, January 5-27, 1920, whose object it was to prevent strikes, lockouts and boycotts, and to provide a just and able tribunal in which to litigate all controversies. The creation of the court arose out of the situation created by the coal strike during 1919 in which all relations between the operators and miners were broken off.

**Industrial Relations, U. S. Commission on,** was created by Act of Congress, Aug. 23, 1912, to inquire into the general condition of labor in the principal industries of the United States, including agriculture, and especially in those which are carried on in corporate forms, into existing relations between employers and employees, into the effect of industrial conditions on public welfare, into the conditions of sanitation and safety of employees, the growth of associations of employers and of wage earners, and the effect of such associations upon the relations between employers and employees, the extent and result of methods of collective bargaining, methods which had been tried in any State or in foreign countries for maintaining mutually satisfactory relations between employees and employers, methods for avoiding or adjusting labor disputes through peaceful and conciliatory mediation and negotiations, the scope, methods, and resources of existing bureaus of labor, the question of smuggling or other illegal entry of Asiatics into the United States or its insular possessions, and the underlying causes of dissatisfaction in the industrial situation.

The final report of the Commission was rendered in August, 1915. The majority report urged the importance of enforcement of existing legislation, and the supplementary report of the employers emphasized the wrongs committed by the labor unions. All reports agreed on the necessity for organized labor.

**Industrial Revolution,** a name applied to

the era of economic and social development in Great Britain introduced by the mechanical inventions of Hargreaves and Arkwright, and covering approximately the years 1760 to 1830. Its principal features were the substitution of the factory system for the domestic system of industry, and the social and economic readjustments involved therein.

Prior to 1869 British industry was conducted chiefly in the home of domestic workers, who often combined with their handicraft the cultivation of small tracts of ground. In 1733 the fly shuttle, the first of a long series of labor-saving inventions, was patented by Kay. In 1764 Hargreaves invented the spinning jenny, Arkwright followed with his spinning machine in 1769, Crompton with the spinning mule in 1779, and Cartwright with the power loom in 1785. In the meantime new methods of smelting gave a great impetus to the iron industry, and the invention of the steam engine rendered obsolete old methods of hand production in all industries.

The inevitable outcome of these great changes was the disappearance of domestic manufacture, the concentration of labor in factories, and the development of large scale industry, with the consequent differentiation of the agricultural and industrial classes, the growth of great industrial centers, the division of labor, the substitution of the unskilled laborer for the skilled workman, production for profit rather than for use or exchange, and the rise of a capitalist class. While the term Industrial Revolution is usually applied to the movement in Great Britain, similar developments may be traced in all modern industrial countries during the 19th century. Consult P. Mantoux, *Industrial Revolutions in the 18th Century* (new ed. 1928).

**Industrial Workers of the World**, popularly known as the I W W, a revolutionary labor organization including men of all trades and crafts, having for its object the overthrow of the wage system, capitalism, and the substitution of ownership and control of the means of production and distribution by the organized workers, thus securing to the workman the entire product of his labor. It was organized at Chicago in 1905. The members of the organization refuse to enter into any trade contracts and are thus free to strike without notice and at a time when such action will prove most effective. Among the strikes conducted by the I W W have been the textile workers' strike at Lawrence, Mass. (1912), the strike in the

rubber industry at Akron, Ohio. In 1917 the I W W was particularly active against the war, engaging in many free speech fights, organizing anti-war mass meetings, inciting workers to resist conscription, and aiming to paralyze industries producing war material. The odium of sedition and of 'German agents' attached itself to the organization, and the powers of the Espionage Act of June, 1917, and of all state and sedition statutes were invoked against it. Mob violence aided the authorities in the suppression of the I W W. In 1931 it gained some notice by its leadership of strikes among the coal miners in Kentucky. Since then its activities have diminished, and with the rise of the Congress for Industrial Organization it has ceased to be a major influence.

**Indy, d', Paul Marié Théodore Vincent d'** (1851-1931), French musical composer, born in Paris. In 1896, with Bordes and Guilman, he founded the Schola Cantorum, and became its director. Among his numerous musical works are *Wallenstein*, *Le Chant de la Cloche*, dramatic legend based on Schiller's poem, *Le Fort Enchanté*, *Istai*.

**Ine**, (Latinized *Ina*) (died 726), king of Wessex, was chosen king in 688. About 693 he published the earliest extant code of West Saxon laws, whereby the great Celtic population of his kingdom was emancipated. Having abdicated (726), he made a pilgrimage to Rome, and died there.

**Inertia**, (Latin 'inactivity'), a universal property of matter fully described in Newton's first law of motion, which asserts that 'every body perseveres in its state of rest or of uniform motion in a straight line except in so far as it is compelled by force to alter that state.'

**Infallibility**, the immunity from error, in all that regards faith and morals, which is claimed by the Roman Catholic Church, and as regards the past by the Greek Church, as represented in the decrees of the councils which that church looks upon as ecumenical. The latter claim, however, which does not go beyond that of inferrancy, or actual exemption from error up to the present time, differs widely from that of infallibility, as put forward by the Roman Catholic Church, which involves not alone an actual historical immunity from error, but such a positive and abiding assistance of the Spirit of God as will at all times protect against the possibility of error. The infallibility claimed by the Catholic Church is thus of two kinds, passive and active—the first in virtue of which the

church never can receive or embrace any erroneous doctrine, the second, in virtue of which she is charged with the function of permanently teaching to the world the essential truths of God, and of authoritatively deciding every controversy by which the oneness of belief among the faithful may be endangered

Two important questions that arise regarding this infallibility have been the occasion of much controversy even among Catholics themselves as to the seat or organ of this infallibility, and as to the matters to which it extends

**Infamy**, in Roman law signified the public disgrace attaching to a person against whom an action involving questions of good and bad faith had been successfully brought—an action concerning tutory or partnership A person declared infamous could not hold an office of distinction, or exercise the franchise, or institute a public prosecution Infamy, in the sense of the state of one who is subjected to a dishonorable punishment, is still of importance in the United States in view of the provision in the Fifth Amendment to the Constitution, that 'no one shall be held to answer for a capital or other infamous crime, unless on a presentment or indictment of a grand jury'

**Infant**, in law, is one who, from lack of age, has not full legal capacity At common law the age of legal capacity for both sexes is twenty-one years A number of the United States have restricted the period to eighteen in the case of females

**Infant, Care and Development of** See **Child**

**Infante**, the title given in Spain and Portugal to the princes of the royal family, the corresponding title of Infanta being given to the princesses

**Infant Feeding** See **Child**

**Infant Hospitals** See **Foundling Hospitals**

**Infanticide**, or the killing of new-born infants, in the law of modern civilized communities, is not regarded in a different light from other cases of murder The practice was, however, regularly sanctioned in the states of the ancient world, such as Sparta and early Rome, in order to prevent the rearing of unhealthy citizens The same idea was prevalent among the Norsemen, Gauls, and other primitive tribes The Poles continued to destroy deformed children until the 13th century Infanticide is still practised by certain barbarous races, though the progress

of civilization is gradually rendering the custom extinct

In order to constitute the crime of infanticide it is necessary that the child should have had a living existence apart from the mother, in other words it must have breathed Accordingly, destruction of a fetus *in utero* or during the process of delivery, though a serious offence, cannot be called homicide See **ABORTION**

**Infantile Paralysis (Poliomyelitis)** is an acute infectious and communicable disease, caused by the generalized distribution throughout the body of a susceptible individual of a specific filtrable virus whose predilection for the spinal cord and brain causes the characteristic symptoms

Described by Heme in 1840, it was not until 1907 that the disease became a serious public health problem in the United States and Canada, at which time an extensive epidemic occurred in New York City Subsequently, there have been each summer isolated cases in many States, together with local epidemics of greater or less extent The greatest known in medical history began in June, 1916, in the city of Brooklyn, and spread throughout the State of New York, in which at least 12 000 cases were reported, and to a less extent in the States of New Jersey, Connecticut, Pennsylvania, and Massachusetts A number of other States reported a marked increase in the usual number of cases In 1931 occurred another destructive epidemic

The disease is largely confined to young children, the greatest number of cases occurring before the 5th year, but older children and even adults are not infrequently affected The age incidence is apt to increase with the progress of the epidemic

Poliomyelitis is spread by contact with discharges from the nose, throat, and bowels of persons having the disease, convalescent from it, or those who, although themselves healthy, are carriers of the specific organism in the nose and throat Common initial symptoms are fever, irritability, stiffness of the neck, tenderness along the spine and certain nerve trunks, digestive disturbances with diarrhea, constipation, and vomiting Paralysis develops from the second to the eighth day or may be deferred for two weeks or more It may affect only a single muscle or group of muscles, or practically the entire body An international campaign against the disease is being conducted by the Milbank Memorial Fund, Warm Springs Foundation (Ga) is the only institution devoted entirely to it The

method of treating the disease in its early stages of Sister Elizabeth Kenny, Australian nurse, was endorsed in 1942 by the National Foundation of Infantile Paralysis and the *Journal of the American Medical Association*

**Infantry**, a body of men trained and organized to fight on foot, the most important of the three arms which constitute the bulk of the fighting force of an army. It moves slowly, but can traverse almost any nature of ground. It is less affected by darkness than the other arms, it can take cover readily, and it is capable of either fire or shock action. Infantry action may be summarized as first overwhelming an enemy by fire, and then completing the victory by assault. The infantry is organized into brigades, of three regiments each, each brigade being commanded by a brigadier general. A colonel commands the regiment which is made up of three battalions. Each battalion, under the order of a major, consists of four companies. A captain, assisted by two lieutenants, commands the company, which, in turn, is divided into platoons and squads under the lieutenants, sergeants, and corporals.

**Infarct**, in medicine, signifies any infiltration of an organ, but the term is usually restricted to a hemorrhagic infiltration, such as follows in arterial embolism.

**Infection**, the entrance of infection into the body, the introduction of the specific germ of one of the parasitic diseases. Infection usually takes place through the delicate membranes of the nose and throat, through the walls of the alimentary canal, or through the outer skin. The first class, the respiratory diseases, includes pneumonia, diphtheria, epidemic meningitis, infantile paralysis, influenza, and the common cold. The second class, the intestinal diseases, includes typhoid fever, cholera, and dysentery. The third class includes the insect-borne diseases—malaria, yellow fever, bubonic plague, sleeping sickness, etc., anthrax, tetanus, and septicemia, caused by accidental abrasions of the skin, and rabies caused by the bite of an infected animal.

**Inference**. See **Deduction**, **Induction**.

**Inferi**, in Roman mythology, are the gods of the lower world, as distinguished from the superi, the gods of heaven. Pluto, the king of the dead, and his wife Persephone, the daughter of Ceres, the earth mother, were the great gods of this world.

**Infidel**, literally untruthful or unbelieving, is one who does not accept a certain religion. Christian usage now applies it to those who deliberately reject Christianity, such as atheists, deists, and agnostics.

**Infinite**. In philosophy, infinite is that which is without any limitation, and, like absolute and unconditioned, is used especially of the Infinite, of God. It is now usual to distinguish, after the manner of Hegel, between a lower or false notion of infinity, as mere immensity or indefinite extension, and a higher or genuine notion of infinity, as that which transcends finite limitations.

**Infinite**. In mathematics, the term infinity and the phrases 'infinitely great' and 'infinitely small' are intimately bound up with what is known as the doctrine of limits. We think of space as being infinitely extended, because however great an extension we specify we can always imagine a greater. Similarly, however large a number may be assigned, we can always assign a greater. The infinite is always greater than the greatest which can be assigned. Infinity is the limit of the greatest assignable, and zero, or 0, is the limit of the infinitesimally small.

**Infinitesimal**, a mathematical term signifying a quantity which may be taken smaller than any assigned value. The differential and integral calculus is frequently called the infinitesimal calculus.

**Inflammation** may be defined as the reaction of the tissues to an irritant—the term irritant including physical and chemical agents, heat and cold, a crush or a blow, as well as those toxic agents known as micro-organisms. It is further a process by which cells and germs accumulate about an injurious substance and tend to remove or destroy it. It has its site in the interstitial tissue of the body. Celsus, born about 50 B.C., is said to have enumerated rubor, tumor, calor, and dolor 'redness, swelling, heat, and pain' as the four marks of acute inflammation, and although these four cardinal signs are not necessarily all present in every inflammation, they to some extent furnish an index to the severity of the process.

When at all possible, an inflamed part should be put at rest, and the engorgement of the vessels should be relieved by elevation of the part, by counterirritation, by purgation, by the application of cold or of astringents, and in some cases by bleeding. Antiseptics are often of value when the site of the inflammation permits their application. Physiological rest of an inflamed organ is highly desirable, and treatment should be adapted to secure this. Should pus form, or even threaten to form, in an inflamed part, early and free incision is in nearly all cases advisable.

**Inflation and Deflation**—Inflation is an increase in the quantity of purchasing power

sufficiently large to bring about, within a relatively short time, a marked rise in prices. Deflation, the opposite of this process, is an arbitrary reduction in the quantity of purchasing power, accompanied by falling prices.

A planned inflation is usually brought about by the action of the central government, when a serious emergency, such as war or economic disaster, makes necessary a large increase of purchasing power. Increased funds may be obtained by levying heavier taxes, by borrowing, or by an increase in the amount of money available. This object may be attained by the debasement of the metallic currency itself, the issue of paper currency to supplement it, or an expansion of bank credit.

The raising of funds through additional taxes, an unpopular measure, avoided when possible, is not necessarily followed by a rise in prices. Taxes transfer purchasing power from taxpayers to the government. Particular prices may change due to the concentration of government purchases on a relatively small range of commodities—but there need be no general rise of prices. Nor do higher prices necessarily follow increased government borrowing provided the loans made to the government come from actual savings of the lenders. However, individual investors in government bonds are not able to take them in large quantities except by the aid of the banks. It is true that in actual practice some part of the money advanced to the government is drawn from the curtailing of consumers' expenditures and a decrease in the amount of money invested in business undertakings, but in large part such advances are made possible by means of the inflation of bank credit.

Whether inflation is brought about by the issue of government paper money or through the expansion of bank credit, the increased purchasing power (measured in money units) raises prices, rising prices necessitate larger expenditures, thus calling for an increase in the rate at which paper money is being issued or bank credit is being created. Inflation, in this way, tends to increase in a cumulative way, until it may be extremely difficult to stop the movement, once it is started.

Periods of inflation and deflation bring about changes in income, unequally distributed. Inflation temporarily benefits the business man and trader, the debtor, and the holder of industrial stocks, and works a corresponding hardship on creditors, bondholders, and all whose incomes are fixed and fail to keep up with the rising cost of living. Deflation, on the other hand, temporarily bene-

fits creditors, bondholders, and those dependent on fixed incomes, salaries or wages, but injures debtors, those engaged in production or commerce, and holders of industrial stocks.

During an inflation, the increased volume of trade and the time lag during which wages fail to keep pace with rising prices benefit such business men as are able to add to their profits through these conditions, and despite the rising interest rates at such times, credit is generally available for increased production. For this reason those whose incomes are rising often bring pressure to bear upon governments to increase inflation. Wage earners, on the other hand, suffer until wages are adjusted to the higher level. Savings decline in purchasing power. Creditors are repaid in money the real value of which has decreased.

The period of stimulation resulting from inflation in its early stages is soon followed by a period of reaction. When inflation reaches the stage when people begin to realize that the value of money is falling, there is a general scramble for protection against a further fall. There is a tendency to invest in real property, such as land and tangible possessions. The inflationary process may continue until the paper has so depreciated that the public will no longer accept it. Russia and Germany after World War I discovered to what lengths inflation may go if unchecked. The story is told of a professor in Berlin who found his life savings were not enough to buy a postage stamp. Deflation by government action is intended to correct the evils of inflation and restore the stability of the currency. This may be done by redeeming the paper at par, by complete repudiation, or by such compromise measures as retiring a part of the paper and restoring the rest to relationship with a metallic standard. Devaluation of the currency in the past has been the principle generally followed as opposed to raising by unduly heavy taxation the funds required for the redemption of paper issues.

Following the disastrous inflation in Germany a new unit of money, the Rentenmark, was created late in 1923, secured by a mortgage on all of Germany, and the old Reichsmark was stabilized at 42 eleven ciphers to the dollar. Millions of investors, especially small holders of bonds, were ruined. France, after World War I, inflated her currency to such an extent that French bondholders and mortgage holders in many cases lost as much as German creditors. After the inflation mortgages were marked down to 25% in Germany. In France, with the franc permanently de-



valuated to one-fifth of its par, mortgages were marked down to 20%. England ended the War with a terrific burden of public debt but in 1925 returned to the gold standard at the old pre-war par of sterling. This plan, representing deflation of a serious kind, resulted in untold hardship for millions of the population.

Following World War II, Hungary and China were gripped by serious inflation.

The economic history of the United States records various instances since the country was first settled of paper money issues to meet fiscal emergencies, especially extraordinary expenditures occasioned by wars. During the pre-revolutionary period of our history, the American colonies issued paper money known as colonial bills of credit to defray their expenses. In the Revolutionary War, the Continental Congress as well as the individual colonies issued paper money. The Continental Congress was virtually driven to this action by its lack of power to levy taxes. The paper went down to practically nothing and we have the expression 'not worth a Continental' surviving to this day.

During the war between the North and the South greenbacks were issued by the Northern States in the total amount of \$450,000,000. The money began to depreciate shortly after February 1862, the date of the first issue. Specie payments had been suspended in 1861 and the government was faced with the absolute necessity of providing some kind of money for the federal treasury. The government sold its bonds for depreciated greenbacks, but it had to pay the interest and ultimately the principal of the bonds in gold. The use of the greenbacks during the Civil War increased the expenses of the government by nearly \$600,000,000. Some greenbacks were retired under an act of 1875 but in May 1878 there were \$346,681,000 outstanding. The currency act of 1900 provided for a gold reserve of \$150,000,000 to be held against them to insure their redeemability. In the South, inflation followed a much wilder course. Prices became fabulous. The currency depreciated steadily until it became absolutely worthless.

The depression from 1929 was preceded by wild speculation, encouraged and made possible by an expansion of credit, especially bank credit, but encouraged and stimulated also by installment selling on a scale never before witnessed. The real estate boom and the stock exchange boom could not have proceeded to this disastrous length had it not been for ex-

panding bank credit and the credit which in the case of real estate booms took largely the form of mortgage piled on mortgage.

To tide over the depression emergency and set the economic system again in motion deflation was advocated which is a limited and controlled inflation, intended to check further deflation. This took the form of credit inflation or direct commodity inflation, through unemployment relief and a public works system. An amendment to the Farm Relief Bill conferred on President Roosevelt authority to issue currency (greenbacks) to accept silver as payment for foreign debts in accordance with the Pittman plan and to devalue the gold dollar (see GOLD). In World War II, President Roosevelt marshaled the anti-inflation forces of the country to curb cost-of-living prices, control wage increases and the shifting of workers, and increase taxes and savings.

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**Inflection**, in grammar, either indicates the relation of the inflected word to others in the same sentence (by case endings), or denotes some aspect of the conception which the word expresses (by tense forms). It is an important feature in the Semitic and Indo-European languages, but outside of these groups does not appear to be common.

**Inflorescence** is the method of arrangement of the flowering branches in a plant, and of the flowers upon them. The simplest form in the flowering shoot bears but a single flower at the termination of the main axis, as in the tulip, or in the axils of the leaves, as in the pimpernel or dog violet. It is with systems of fertile shoots, however, that inflorescence is concerned, and the numberless modifications are, generally speaking, in the direction of the aggregation of the flowers themselves and the reduction of the foliage leaves, with the result that the flowers become more conspicuous to insects and are more readily reached by them. The principal forms may be reduced to two groups—monopodial, or botryose, in which the branching is for the most part confined to the main axis of the plant,

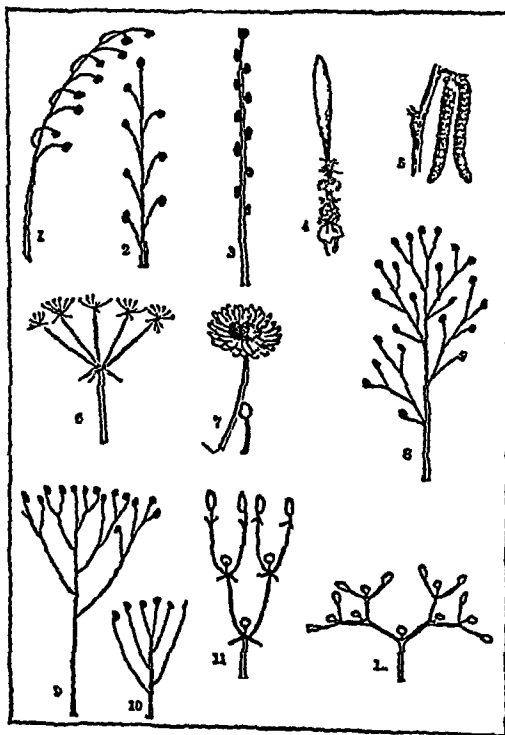
sympodial, or cymose, in which the lateral axes out-top and grow more vigorously than the main axis

In the simplest forms of monopodial inflorescence the lateral axes are unbranched. The raceme has the main axis elongated, and bears stalked flowers, as in the barberry, currant, and mignonette. When the flowers are sessile, as in the plantain and the mullein, the inflorescence is a spike. If the axis of the spike is fleshy, as in the common arum, it is called

garded as a flattened panicle, by others as derived from the raceme. The cyme itself resembles a corymb in appearance, but the center flowers bloom first, those on the outer rim blooming last—the reverse of the succession of bloom in the corymb. When the cyme is very crowded it becomes a glomerule, as in the case of the dogwood blossom.

**Influence Machines, Electric** See **Electrostatic Machines**

**Influenza, or La Grippe**, an infectious



*Forms of Inflorescence*

1, 2, Raceme, 3, Spike, 4, Spadix, 5, Catkin, 6, Umbel, Compound, 7, Capitulum, 8, Panicle, 9, 10, Corymb, 11, 12, Cyme

a *spadix*, and a *catkin* is a unisexual spike that drops after flowering—willow, birch, poplar. In the umbel and the capitulum the main axis is contracted, in the former the flowers are stalked, seemingly arising from the same point, as in the wild carrot, and in the latter sessile, as in the daisy. In the panicle the lateral axes are branched, as in the horsechestnut and lilac. It may be compared to a raceme, in which each pedicel or flower-stalk is branched. The corymb (elder and hawthorn) is by some re-

garded as a flattened panicle, by others as derived from the raceme. The cyme itself resembles a corymb in appearance, but the center flowers bloom first, those on the outer rim blooming last—the reverse of the succession of bloom in the corymb. When the cyme is very crowded it becomes a glomerule, as in the case of the dogwood blossom. **Influence Machines, Electric** See **Electrostatic Machines** **Influenza, or La Grippe**, an infectious epidemic disease affecting the air passages. An alarming epidemic occurred in the Far East in 1889 and swept over Europe with extraordinary rapidity, attacking about 40 per cent of the population. Since then it has appeared annually as an epidemic, frequently of widespread distribution, in Europe and the United States. The illness generally begins with a shivering fit, after which come general discomfort, aching of the limbs, and rise of temperature. Headache is a prominent symptom,

and is often most severe behind the eyes. In the limbs the pain is deep 'in the bones,' but is not attended by any redness or swelling, nor is it confined to one limb or joint. The great dangers of influenza are due to the exhausting effect which the poison has upon vital organs, and to the fact that the sufferer is, for a considerable time, more prone to contract other diseases, particularly chest troubles.

In treating an attack, the most important thing is to send the patient promptly to bed in a warm room, and to keep him there until at least twenty-four hours after all active symptoms have disappeared. Light food should be given frequently, but in small quantities at a time. Preventive measures include avoidance of crowds, and of all the usual modes of infection, as using another's glass, spoon, etc., plenty of fresh air, scrupulous cleanliness, and careful attention to the general health.

During the summer of 1918 an extensive epidemic of a disease called Spanish Influenza closely resembling influenza was reported from Europe, being especially prevalent in Spain, where nearly one-third of the population was attacked, and in Germany and Great Britain. A similar epidemic visited Cuba in June, 1918, and local outbreaks occurred in the United States, in the late summer and fall of 1918, first in various military camps and cantonments and later in civilian communities. On Sept. 25, 1918, Surgeon General Rupert Blue of the U. S. Public Health Service reported that the malady had occurred in twenty-six States. A comparison of the whole prevalence of Spanish influenza in 1918 with the pandemic of 1889-92 shows that the clinical course of the former is very similar to if not identical with that of the previous outbreak, while the findings of bacteriologists have been of the same varied character in both epidemics.

**In Formâ Pauperis**, in England the right to sue or defend an action *in formâ pauperis* 'in the character of a pauper,' is an ancient privilege still accorded those unable, through poverty, to maintain a suit at their own expense. In the United States it is generally regulated by statute or rules of court.

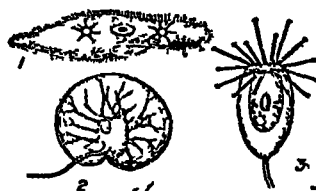
**Information** is a process by which crimes are prosecuted not on indictment found or presentment made by a grand jury, but on complaint of a public officer. More strictly the term denotes the complaint itself. Private persons are often allowed to bring accusations in the name of the attorney-general or other officer, and are then technically known as *relators*.

**Information, Military**. See *Reconnaissance*.

**Informer**, one who brings an accusation of crime or other violation of law for the sake of gaining immunity or some other advantage to himself.

**Infusions**, in medicine, are those preparations in which the active principles of certain plants are extracted by water at a lower temperature than boiling point. Tea is an example of a domestic infusion.

**Infusoria**, actively motile Protozoa, which appear in infusions of animal or vegetable matter. They were formerly believed to be spontaneously generated in such infusions, but it is now known that they are present in the dust, etc., on the substances of which the infusion has been made.



Infusoria

1, *Paramacium aureum*, 2, *Noctiluca miliaris*, 3, *Acineton lividum*

**Ingalls, Walter Renton** (1865), American engineer and editor, was born in Lynn, Mass. He was engaged in various mining enterprises, and was chief of the commission appointed by the Canadian government to report on the zinc resources of British Columbia (1905-6). He was editor of the *Engineering and Mining Journal* (from 1905), and of *The Mineral Industry* (1905-10).

**Inge, Very Rev. William Ralph** (1860- ), Dean of St. Paul's Cathedral, London, from 1911 to 1934. A prolific author and frequent commentator on current events, his unwillingness to share in passing optimism brought him the sobriquet, 'The Gloomy Dean,' by which he is perhaps best known to Americans. His works include *Christian Ethics and Modern Problems* (1930), *Things New and Old* (1933), and *Talks in a Free Country* (1943).

**Ingelow, Jean** (1820-97), English poet and novelist, was born in Boston, Lincolnshire.

**Ingemann, Bernhard Severin** (1789-1862), Danish author, was born in Thorkildstrup. From 1822 until his death he was instructor at the Soro academy and during that time did his best and most important literary work. This includes the epic poem *Valdemar*.

*den Store* (1824), the historical romances *Valdemar Sejer* (1826) and *Erik Menveds Barndom* (1828)

**Ingersoll, Ernest** (1852-1946), American naturalist and author, was born in Monroe, Mich. He was associated with the Hayden Survey and the U S Fish Commission (1874-7), subsequently served as zoological editor of the *Standard Dictionary*. He published *Knocking Round the Rockies* (1883), *Wild Neighbors* (1897), *Birds in Legend, Fable, and Folklore* (1923), *Dragons and Dragon Lore* (1928)

**Ingersoll, Jared** (1750-1822), American jurist, was born in New Haven, Conn. Settling in Philadelphia, he became one of the most prominent lawyers of the Pennsylvania bar. He was a member of the Continental Congress (1780-81) and of the Federal Constitutional Convention (1787). One of his famous cases was the defence of Senator William Blount, impeached by the House of Representatives.

**Ingersoll, Robert Green** (1833-99), American lawyer, lecturer, and writer, was born in Dresden, N Y. the son of a Congregational minister of very broad views. He became a Republican campaign orator, and in a famous speech proposed James G. Blaine for the Presidential nomination at the National Convention of 1876. Later he entered the lecture field, and was widely known for his strong opposition to Christianity, as manifested in a forceful series of agnostic lectures. He published *The Bible, The Gods, and Other Lectures* (1876), *Some Mistakes of Moses* (1879), *Lectures Complete* (1883), *Great Speeches* (1887), *Foundations of Faith*. Consult H. E. Kittredge's *Ingersoll* (1911).

**Ingham, Charles Cromwell** (1796-1863), American painter, was born in Dublin, Ireland. He came to New York in 1817, where his youthful work, *Death of Cleopatra*, was the sensation of the day. He was a founder of the National Academy of Design (1826), and later its vice-president (1845-50), and he was one of the founders of the Sketch Club. He painted portraits of De Witt Clinton and Lafayette, his *Flower Girl* is in the Metropolitan Museum of Art.

**Ingoldsby, Sir Richard** (d. 1685), British soldier, was born in Buckinghamshire. He commanded a regiment on the Parliamentary side in the Civil Wars, and was a member of the court that condemned Charles I to death.

**Ingolstadt**, fortified town, Bavaria, Germany. Interesting features are the old castle of the dukes of Bavaria-Ingolstadt, a Gothic

Frauenkirche containing the tomb of Eck, Luther's opponent, and the first Jesuit college founded in Germany (1555), p. 29,000.

**Ingraham, Duncan Nathaniel** (1802-91), American naval officer, was born in Charleston, S C. He is best known for his connection with the Koszta Affair. His course in this matter was approved by the U S Government, and brought him much popularity at home.

**Ingraham, Joseph Holt** (1809-60), American religious writer, was born in Portland, Me. He was the author of a series of popular sea tales and religious romances, the latter including *The Prince of the House of David* (1855), *The Pillar of Fire* (1859), *The Throne of David* (1860).

**Ingres, Jean Auguste Dominique** (1780-1867), French historical painter, the leader of the classical school, as opposed to the romanticists under Delacroix, was born in Montauban. He became a pupil of David in 1796, and five years later gained the Prix de Rome. He painted *The Vow of Louis XIII*, which on its exhibition at the Paris Academy in 1824, broke down the indifference of the public to his work. To this period belong also his best portraits, and his *Oedipus and the Sphinx*, *Venus Anadyomene*, *Romulus and Acron*, *Virgil Reading the Aeneid*, *Raphael and Fornarina*, *Roger and Angelique*. Returning to Paris, in 1826, Ingres was appointed professor of fine arts at the Academy, and became the recognized head of a great school.

**Inheritance**, in the restricted sense, is the transmission of real estate by descent, though the term is used popularly to describe the devolution of chattels as well as of lands by the death of the former owner intestate, or the transmission of any property, real or personal, by last will and testament.

**Inheritance Tax**, a tax or charge imposed upon the devolution of the property of a deceased person to his heirs or legatees. This is a very old form of taxation, having first been imposed in the Roman Empire to raise money for the support of the army. The legal philosophy underlying the tax is that there is no natural right on the part of an heir or legatee to succession to the property of a deceased person, and that since the privilege is conceded and protected by the state, the latter has a constitutional right to declare the terms upon which the estate shall devolve.

Most statutes make a distinction between direct, or lineal, and collateral heirs. Where the property goes to direct heirs, a certain amount is generally exempt so that no hard-

ship may result to those who have been dependent upon the deceased for support, and upon the surplus over this amount the rate is usually less than if the property devolved upon collateral heirs. Inheritance taxes are now in force in practically all the countries of Europe, in Great Britain and her colonies, and in the United States.

In the United States, estate or inheritance taxation was made a part of the General Revenue Act, effective Sept. 8, 1916, and has since remained a permanent source of Federal revenue. Inheritance taxes in some form are imposed by nearly if not quite all States in the U. S. The most acute problem of inheritance taxation at the present time is that of multiple taxation of the same property by different States in consequence of varying rules of situs. In the case of real estate, situs is ordinarily assignable to the State in which the property is located, but in the case of personal property, especially corporate securities and other forms of intangible property, varying rules of situs, including domicile of the decedent, domicile of the corporation, location of the securities and location of the property represented by the securities, make it possible for the same property to be taxed under the inheritance tax laws of three or four different States. Federal inheritance taxes are laid by virtue of the Federal estate tax imposed by the Revenue Act of 1926 as amended, also by virtue of the additional estate tax imposed by the Revenue Act of 1932 as amended. There are allowances against Federal inheritance taxes by reason of inheritance taxes paid to States.

**Inhibition**, English legal term, used especially in ecclesiastical law for a writ from a superior to an inferior court, suspending proceedings in a case under appeal. It is also used for the suspension of an offending clergyman. As a term in Psychology, it refers to the suppression of one nervous process by another.

**Inia**, (*Inia geoffrensis*), a toothed freshwater cetacean, not unlike a dolphin. It is found in some of the upper tributaries of the Amazon, and in the lakes near the Cordilleras. It measures about 8 ft. in length, has a long cylindrical snout with stiff hairs and a very slight dorsal fin.

**Inisfail**, a poetical name for Ireland.

**Initials**, first letters of a person's name.

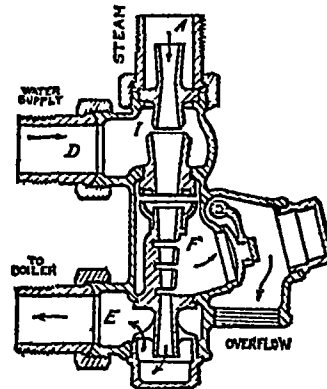
**Initiative**, a political measure which, under certain specified conditions, vests in the people the right of proposing new laws or of abrogating old ones. It is the right of petition, coupled with the right of legally forcing that

petition to be taken into consideration, amounting practically to direct legislation by the people.

The initiative is closely allied with the referendum, and these two methods are the ultimatum of democracy. Some such systems obtained in the city states of ancient Greece, but it finds its completest application in modern Switzerland. From Switzerland the initiative passed to the United States, where it was first adopted by South Dakota in 1898.

**Injection** in medicine, the introduction of therapeutic or nutrient agents into the cavities or tissues of the body by means of mechanical contrivances such as syringes.

**Injector**, an instrument by means of which water can be forced into a boiler against the pressure of the steam. A modern injector is shown in section in the accompanying figure. A jet of steam enters from the boiler at A, and discharges through the nozzle shown into



Automatic Injector

the larger opening of the combining tube. This entrains air at A, creates a partial vacuum, and brings the feed water through the pipe D. The cold feed water is drawn down the combining tube, condenses the steam, and acquires considerable velocity, so that it flows along the extension of the combining tube. In passing through the final and diverging passage the velocity is reduced and the pressure correspondingly increased. The water receives sufficient velocity from its contact with the steam, so that its pressure finally rises above that of the boiler, and it opens a check valve and enters. Thus the apparent anomaly exists of steam from a boiler blowing water into the boiler against the steam pressure.

The openings in the combining tube at A permit the escape of steam and water to the overflow, until the pressure rises in E above

the boiler pressure. This flow to the boiler is through a non-return or check valve, not shown here, which prevents any return of water when the injector is not operating. In this design of injector starting is by opening the valves in the pipes leading to A and D. Consult Kneass' *Practice and Theory of the Injector* (1910).

**Injunction**, a writ issued by courts of equity forbidding a person or persons to do a certain act. It may also order him to do something, but writs of this kind, known as mandatory, as opposed to prohibitive injunctions, are now practically obsolete. Injunctions may be either interlocutory or final. The former, also known as preliminary or temporary injunctions, or injunctions *pendente lite*, are issued while the merits of the case are under investigation, in order to prevent damage being done in the meantime. In cases of great emergency the court may grant an *ad interim* injunction on the simple application of the complainant, and without previous intimation to the other party. This will be effective only till the court, after hearing both sides, determines whether a regular interlocutory injunction ought to be issued. A final injunction is granted after the suit has been decided in the complainant's favor, and usually takes the shape of an order, making a previous interlocutory injunction permanent. In the United States the writ of injunction has been the frequent resort of employers to prevent or stop labor strikes, and its indiscriminate use in such cases has been bitterly assailed by organized labor.

The Norris-LaGuardia anti-injunction law, signed by President Hoover in 1932, voided so-called 'yellow dog' contracts which employers had used to prevent workers from joining unions, gave defendants in contempt cases the right to trial by jury and rigidly limited injunctions in labor suits without prior hearings unless unlawful acts have been committed. It was sponsored by Senator George W. Norris and Representative F. H. LaGuardia.

**Injury (Legal)** See **Contract**

**Injury (Medical)** See **Wounds**, **Shock**.  
**Inkberry**, or **Winterberry** (*Ilex glabra*), an evergreen shrub of the Holly family, growing from 2 to 4 ft. high, found along the east coast of North America in sandy soil. It bears small black berries, from which the name is derived.

**Ink Cap** See **Mushrooms**

**Inks and Stains** *Inks*, in general, are fluid substances which, when applied to a suitable

surface, leave upon it a partially or wholly indelible impression. The use of ink dates back to the era following the invention of writing, the earliest examples being found among the papyrus documents of ancient Egypt. The Chinese and Japanese had adopted the use of ink at an early period, Pliny, Vitruvius, and other classical authors mention writing inks, and old deeds and manuscripts show that its manufacture had reached a high degree of perfection in the Middle Ages.

Black writing inks are of several classes. Tannin inks are prepared by adding a decoction of gall nuts, tanner's barks, or other vegetable matters containing tannic or gallic acid, to a solution of copperas. Logwood chips or logwood extract is substituted for part of the galls in the preparation of the so-called logwood tannin inks. Alizarin inks are tannin inks to which acetic or sulphuric acid has been added to prevent the precipitation of tannate of iron. Other black writing inks are the logwood inks, which depend upon the property of a logwood infusion for forming a dark liquid with neutral chromates, and inks prepared from certain aniline blacks, as negrosine, extensively used, because of their fluidity, for fountain pens. Copying inks are prepared by the addition of sugar, gum, or glycerin to ordinary writing inks. Hectograph ink is a special form of copying ink which permits the taking of many copies from a single original. Typewriter inks are similar to hectograph inks. The principal red inks are those prepared from magenta, eosin, and carmine. A great variety of colored inks may be prepared from the aniline dyes. Sympathetic or secret inks are solutions which when applied to paper are invisible, appearing only under the influence of heat or chemical action. Indian or Chinese ink is a mechanical mixture of the purest and densest lampblack, with a solution of gum, gelatin, or agar-agar. Indelible ink is used chiefly for marking linens and for cancellation and endorsing purposes. Special inks are made for writing on glass, metal, celluloid and other substances. Stains are similar to inks except for the presence of gum in the latter.

**Inland Waterways** The inland waterways of the United States comprise the Mississippi system, the Great Lakes with the N. Y. State Barge Canal and Hudson River, the Atlantic coast rivers and the intracoastal waterways connecting them, the Gulf Coast rivers and the intracoastal system from Mobile, through New Orleans, along the Texas coast, with connections with the Southern Louisiana waterways and the Mississippi, the San Joa-

quin-Sacramento system, California, the Columbia River and its tributaries in the n w , and the lesser rivers of the Pacific coast

With the growth of railroads in the United States inland water transportation suffered a marked decline. Agitation for its revival dates from about 1895, when the International Waterways Convention met in Cleveland. In 1907 President Roosevelt appointed the Inland Waterways Commission. Among the more important projects put forward were the following: the Lakes-to-Gulf Deep Waterway, the canalization of the Ohio River, authorized by Congress in 1911, the Lake Michigan-Lake Erie Canal, the Atlantic Coast Inland Waterway from Boston to Beaufort, N C, and thence on down the Florida coast, the Interstate Inland Waterway, joining the bays, passes, and lakes along the Gulf Coast, the Atlantic and Great Western Waterway, joining St Louis, Mo, with Brunswick, Ga. In the United States, waterways are built and maintained at public expense. In 1933 the Illinois Waterway was opened connecting Lake Michigan with the Mississippi River. This waterway has a length of 326 miles, is 9 feet in depth and has a width varying from 160 to 300 feet. This project which completed a waterway from Chicago to New Orleans (the Great Lakes-to-Gulf Waterway) gave rise to demands in Chicago to have the Federal Government take over further developments in the Great Lakes. In 1935 work started on the Atlantic-Gulf Ship Canal, across Florida, from Jacksonville to Port Inglis, but was suspended in 1936. During World War II traffic on the inland waterways of all countries was increased.

**Inlaying** is the art of decorating flat surfaces by the insertion of materials differing from the ground or body in which they are inlaid, in color, texture, or other qualities. Inlaying in wood is known generally as *marquetry*, in metals the inlay principally practiced is called *damascening*, and in marble and precious stones it forms a variety of *mosaic* work. As in the case with most decorative arts, the origin of inlaying can be traced to Eastern countries.

**Inman, Henry** (1801-46), American painter, was born in Utica, N Y. His portrait of William Penn hangs in Independence Hall, Philadelphia.

**Inn**, a place where travelers are entertained with food and lodging. Legally, a mere restaurant is not an inn, nor is a boarding house.

**Inn**, a river of Germany rises in the Alps,

and flows to its junction with the Danube at Passau.

**Inness, George** (1825-94), American landscape painter, was born near Newburgh, N Y, and passed the greater part of his boyhood in Newark, N J. He then spent a short time in the studio of Regis Gignous in New York City, and in 1847 took his first trip to Europe, spending fifteen months in Rome. He made his home for most of his life near New York. He is represented at the Art Institute of Chicago, the Metropolitan Museum of Art, the National Art Gallery, and in other museums. Among his works are *Niagara Falls* (1883), *Sunset—Montclair* (1884), *Coast of Cornwall*. Consult *Life, Art, and Letters of George Innes*, by George Innes, Jr (1917).

**Inness, George, Jr** (1854-1926), American painter, was born in Paris, France. He devoted himself to animal and landscape painting. His works include *The First Snow at Cragmoor* and *Shepherd and Sheep* (Metropolitan Museum of Art).

**Innocent**, the name of thirteen Popes — **INNOCENT I**, a native of Albano, who became Pope in 402, vigorously enforced the celibacy of the clergy and the supremacy of the Roman see. He died in 417, and was canonized — **INNOCENT II** (Gregory Papareschi), 1130-1143, was several times driven from his chair — **INNOCENT III** (Lotario de' Conti), 1198-1216, born in Anagni, succeeded Celestine III. His pontificate is justly regarded as the culminating point of the temporal as well as the spiritual supremacy of the Roman see. As an ecclesiastical administrator Innocent holds a high place. It was under him that the celebrated Fourth Lateran Council was held in 1215. **INNOCENT IV** (Simbaldo de' Fieschi), 1243-54, Genoese, succeeded Celestine IV. He was exiled because of his quarrel with Frederick II of Germany and the Ghibellines — **INNOCENT V** succeeded Gregory X — **INNOCENT VI** (Etienne d'Albert), 1352-62, French, resides at Avignon — **INNOCENT VII** (Cosimo de Migliorati), 1404-06, pontificate marked by nepotism — **INNOCENT VIII** (Giovanni Battista Cibo), 1484-02, of Greek extraction, a licentious man, elected in 1484 by improper means, who became so deep in debt that he had to pledge the papal tiara — **INNOCENT IX** (Giovanni Antonio Facchinetti) — **INNOCENT X** (Giovanni Battista Pamphilj), 1645-55, Roman, opposed Jansenism — **INNOCENT XI** (Benedetto Odescalchi), 1676-89, born at Como, quarrelled with Louis XIV, and elicited the famous 'declarations of the Gallic clergy' —

**INNOCENT VII** (Antonio Pignatelli), 1691-1700, Neapolitan, was reconciled to Louis XIV.—**INNOCENT XIII** (Michel Angelo Conti), 1721-24 Roman, able, but was opposed by France and Spain

**Innominate Artery**, one of the large arteries rising from the arch of the aorta

**Innsbruck**, chief tn in the Austrian prov of Tyrol, is beautifully situated at the foot of the Alps It is adorned with fine public monuments, the colossal marble sarcophagus erected, between 1509 and 1593, in the Franciscan church (16th century) to the memory of the Emperor Maximilian I, Tyrolese museum (1842), the imperial castle (1766-70), and the Ambras castle Innsbruck has a university, founded in 1672, p including the suburbs, over 53,000

**Inns of Court** The four great incorporated law societies of England—the Inner Temple, Middle Temple, Lincoln's Inn, and Gray's Inn—which alone have the right to admit law students and call them to the English bar See **BARRISTER**



*The Inns of Court, London, Lincoln's Inn Chapel and Old Hall*

**Inoculation** is the intentional or accidental introduction of certain products of disease into the body through the skin or mucous membrane accidentally or for the purpose of immunization Pasteur's treatment for hydrophobia is based on a similar principle, as are also the various serum injections for diseases Accidental inoculation may be produced by the bite of an animal (insects are of importance in this connection), or by the contact of a specific virus with any abrasion or wound on the skin or mucous membrane

**Inosite**,  $C_6H_5(OH)_6$ , is a crystalline solid resembling sugar that is found widely distributed in the animal and vegetable organism

**Inouye, Kaoru** (1835-1915), Japanese statesman, born in Choshu province, Western Japan He accompanied Marquis Ito to Eng-

land in 1864, both traveling incognito, and supported him in his contention that Japan should adopt Western ways, and afterward served in the foreign office seven years He also was minister of the interior

**Inquest** A special proceeding, adapted to a great variety of circumstances, for ascertaining the facts of a case by the verdict of a jury Its most frequent applications today are in coroner's inquests, and in judicial proceedings to ascertain the amount of damages due in a suit which is uncontested

**Inquisition**, a tribunal established by the Roman Catholic Church in the middle ages for the detection and punishment of heresy This new institution was soon introduced into Spain, Italy, and Germany It never obtained a foothold in Northern France or an entry into England The Spanish Inquisition at first differed in nowise from the comparatively innocuous institution elsewhere, but it was reorganized (1478) to make it more efficient against the Jews, who were alleged to be plotting against the government In spite of the protests of Pope Sixtus IV, the right of appointing inquisitors, and apparently of directing the operations of the tribunal, was reserved to the Spanish crown, and from this date Catholic historians disclaim all responsibility for its operations But the inquisitors were churchmen, and the infamous Torquemada was a Dominican It is charged against this Inquisitor that he condemned 9,000 persons during his tenure of office Charles V and Philip II attempted to employ it in the Netherlands as a means to quell political revolt rather than to extirpate heresy

The ceremonial *auto-da-fe* (act of faith), at which the sentences of the Inquisition court were read, was usually held on a Sunday between Trinity and Advent, and those convicted of heresy were formally handed over to the state for torture or execution The first recorded was in 1481 and the last in 1813 Gradually the vigor of the Inquisition was relaxed as the religious passions of the period died down, but it was not till 1835 that it was finally abolished The Inquisition as the Holy Office still exists, but its function is confined to the detection of heresy in books See Lea's *Hist of the Inquisition* (3 vols 1888), Llorrente's *Hist of the Inquisition in Spain* (Eng trans 1826), Mohmer, *L'Inquisition dans le Midi de la France* (1880), Lea, *Chapters from the Religious Hist of Spain* (1890), Dwenger, *Spanish Inquisition* (Catholic presentation, 1890), Tanon, *Histoire des Tribunaux de l'Inquisition en France* (1893) Hefele,



*Cardinal Ximenes* (Eng trans 1885), Pollard, *Inquisition in the Netherlands* (1900)

**Insanity**, or disorder of the mental function, is a symptom of many morbid changes in the brain, which is the organ of the mind

The symptoms of insanity may be considered under (1) general mental disturbance, (2) change in will-power, (3) alteration of feelings and instincts, and (4) insane habits

1 Most prominent of these groups is the *general mental disturbance*, which may take the form of (a) depression, (b) exaltation, (c) enfeeblement, or (d) perversion of mind

On account of his diseased mental action the patient becomes the subject of delusions or false beliefs. In some cases patients labor under delusions upon one subject or upon one set of subjects, and are apparently insane only to that extent. Another set of symptoms is associated with the condition of the will and the power of self-control, which are generally weakened in the insane. The unsound in mind are often the creatures of impulse, and are liable to fits of irritability or anger produced by petty causes which would not disturb the equanimity of a well-balanced individual. The inborn love of life may be replaced by a desire for death that induces the patient to attempt suicide, while the natural feelings of love may be so distorted that he seeks to destroy his nearest and dearest. Similarly the sexual instinct may be lost or deprived, and the patient may indulge in indecent or immodest speech and action. As a result of these various disturbances certain insane habits are formed. Congenital imbecility and idiocy exist from birth or from infancy. General paralysis is a distinct disease. For insanity in its legal aspect, see LUNACY.

**Inscriptions** are records cut, engraved, or moulded on stone, metal, wood, clay, or other similar material, as distinguished from literary records, which are written with ink or other coloring matter on substances such as papyrus, parchment, or paper. The term 'inscriptions' is particularly applied to records of the kind described which have come down from antiquity. Inscriptions are the sole authorities for some periods of history. Almost all the ancient monuments of Egypt bear inscribed records, written mostly in a character known as the hieroglyphic. The oldest is an ivory palette, bearing the name of King Menes, dating about 4700 B C. Many inscriptions have been found in Persia, Babylonia, Syria, beginning with Leyard's discoveries about the middle of the 19th century, and more recent discoveries, particularly those of

the American Exploration Fund, have unearthed whole libraries of inscribed bricks of clay. Many inscriptions in the Phœnician character have been found—one a bronze vessel of the reign of Hiram, about 1000 B C, now in the Bibliothèque Nationale at Paris, and the Moabite stone, recording the events of the reign of Mesha, king of Moab, about 800 B C, including his war with Ahab. Greek inscriptions include laws and treaties, lists of the fallen in battle, private epitaphs, contracts, tribute list, and indeed every kind of official and private record. Of Latin inscriptions the oldest date about 300 B C, that on the tomb of the Scipios is famous. They are marked by a special style, with many conventionalisms and abbreviations. One of the most useful historically is the great inscription composed by Augustus, and known as the *Monumentum Ancyranum*. Indian inscriptions are numerous, the oldest are the edicts of Asoka, a Buddhist king who reigned about 300 B C. Inscriptions in Runic character exist in Sweden, Norway, Denmark, England, the Isle of Man, and elsewhere. There are many native inscriptions of the American Indians, in a sort of picture writing, in the ruined cities of Yucatan, Honduras, Mexico, and Guatemala.

**Insecticides** The enemies of plants are destroyed by the use of various substances known as Insecticides. These are not necessarily poisonous in character. The insects to be destroyed are of two general classes, and the insecticide must be chosen accordingly. They are (1) biting, or gnawing insects, those which actually bite and masticate portions of the plant, and (2) sucking insects which introduce a tube or beak through into the soft, succulent tissues and extract the juices of the plant. The first class can be destroyed by mixtures containing arsenic, such as Paris green, Scheele's green, arsenate of lead, and London purple. The direct application of such arsenicals to plants, usually by means of spraying, at the proper time, is the easiest way of destroying the insects. The second class of insects, which eat nothing on the surface and are not affected, therefore, by arsenical poisons, are destroyed by corrosive and suffocating substances, such as soaps, petroleum, sulphur, pyrethrum powders, hydrocyanic-acid gas, and bisulphide of carbon vapor. DDT was available to civilians in 1946. See *U S Dept of Agricul, Farmers' Bull, Frear, Chemistry of Insecticides* (1943).

**Insectivora**, or **Insect-Eaters**, an order of mammals whose members are mostly nocturnal, are of small size, and feed upon insects

and other small creatures. The order is not very well defined. They are among the oldest and most primitive of mammalian stocks, preserved mainly, probably by their small size, nocturnal and secretive habits and abundant food. They are numerously represented in North America by the moles, shrews, and their kindred.

**Insectivorous Plants**, a collective name for plants that entrap insects and other small animals, feeding on the captures by a process of true digestion, or absorbing the results of decomposition. John Ellis received examples of Venus's fly-trap (*Dionaea muscipula*) from Dr. Garden, and in 1768 sent a description of the plant and its habits to Linnæus. This, the highest form, belongs to the order Droseraceæ. It is a native of the peat bogs of the Carolinas. The halves of the leaf blade are movable on the midrib, and furnished on each margin with teeth. On each half of the blade are three sensitive hairs, and the whole surface is thickly set with digestive glands. Immediately an insect touches one of these hairs the blades close, the teeth interlock, the glands exude their digestive juice on the insect, and the products are absorbed. In the pitcher plants compound leaves are modified into pitcher-like receptacles, sometimes with a lid, as in the common *Sarracenia purpurea*, and the southern *S. flava*, both growing in sphagnum bogs. The attractions for insects are bright colors, and glands secreting nectar. Beneath the sweet bait is a slippery surface, affording insecure foothold, and insects pitching thereon fall into the secretion at the bottom.

**Insects**, which constitute the class Insecta, are by far the most abundant of land animals. The typical home of the class is earth or air, and it is as terrestrial forms that they attain vast abundance. Not only are the species enormously numerous, but the reproduction of the individual is rapid.

Insects are defined by the possession of the following characters. The segmented body is divided into three regions—viz. the head, thorax, and abdomen. The first bears a pair of antennæ in addition to the appendages round the mouth, the thorax bears three pairs of legs, and frequently two pairs of wings in addition, the abdomen is without true jointed legs, though it may possess what appear to be modified appendages. Not infrequently there is a metamorphosis in development, the larvæ being then very unlike the adults.

**External Appearance**—The head is of much functional importance, in that it bears the chief sense organs and contains the most im-

portant of the nerve centers, anatomically it is in the higher forms sharply separated from the rest of the body. The head always bears a pair of antennæ, which are delicate sense organs, very freely movable, and varying greatly in size and appearance. The other three pairs of cephalic appendages are placed round the mouth. In the majority of insects they consist, first, of a pair of mandibles, which are hard-toothed organs, reaching a great size in certain beetles. Behind the mandibles come the paired maxillæ, which consist usually of a basal piece divided into two segments, a slender jointed palp, and an inner branch divided into two. The third pair of mouth appendages is constituted by the labium, formed by the union of the members of the pair in the middle line. In addition to the jointed appendages, the head of insects bears compound eyes, and not infrequently simple eyes in addition.

The thorax is composed of three segments, each of which is composed of several elements—e.g. the tergum or dorsal region, the ventral bar or sternum, and the side pieces or pleura. The degree of development of the three thoracic regions varies greatly. Each of the thoracic segments bears a pair of legs. The wings consist of two layers, between which lie tracheæ. Typically insects have two pairs of wings, but variations in the shape and structure of the wings are of great importance in classification.

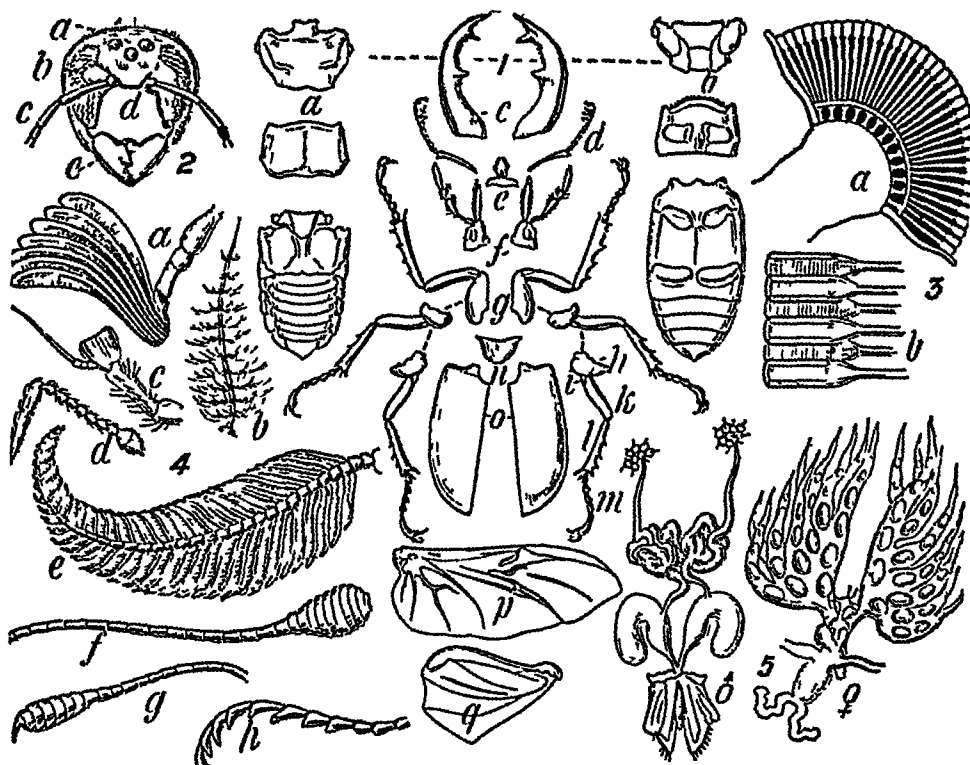
The respiratory system is very perfectly organized. It consists essentially of a series of tubes ramifying throughout the body, and opening to the exterior by orifices called stigmata. The tubes are the tracheæ, they are lined with chitin, and are strengthened internally by a spiral thread. The tracheal capillaries supply every organ and every region of the body, so that by this means oxygen is carried direct to the tissues without the intervention of the blood.

As regards reproductive organs, the sexes are separate, and in many insects, in addition to males and females there are neuters, usually modified females, which do not reproduce, though they may have important functions to perform in social life. Insects reproduce rapidly, each generation being relatively short-lived, but the life history is often complex. Only a few characteristic life histories can be noticed here. In the 'straight-winged' or orthopterous insects, such as locusts, grasshoppers, cockroaches, and so on, the young leave the egg-case in the form of miniature adults, save that they are without wings. These young grow, moult or cast their

coats, and by successive moults acquire the wings of the adult. On the other hand, the egg laid by the butterfly hatches, not a miniature adult, but a larva which differs from the adult not only in the absence of wings, but in the shape of the body, the structure of the mouth parts, the length of the antennæ, the mode of life, and the internal structure. In this case the caterpillar, when full

quiescent pupal stage occurs, and the metamorphosis is thus described as incomplete.

Aptera are primitive wingless insects, which have no metamorphosis in development. Orthoptera, the straight-winged insects, have four wings, the anterior pair being more or less leathery, and smaller than the hind pair, there is no metamorphosis in development. Examples, locusts, grasshoppers, cockroaches



*Insects Structure*

1 Parts of a beetle a, b, head, thorax, abdomen (upper and under side respectively), c, mandibles, d, antennæ, e, labium, with palpi attached, f, maxillæ, with palpi attached, g, legs, h, coxa, i, trochanter, k, femur, l, tibia, m, tarsus, n, scutellum, o, elytra, p, wing, open, q, wing, folded 2 Head of a Wasp (*Vespa crabro*), a, ocelli, b, compound eyes, c, antennæ, d, scutellum, e, mandibles 3 Compound eye of Beetle (*Melolontha vulgaris*) a, section, b, some of the lenses on larger scale 4 Forms of antennæ a, cock chafer, b, gnat (male), c, tachinid fly, d, weevil, e, ermine moth, m, fritillary butterfly, g, skipper butterfly, h, cardinal beetle 5 Reproductive organs of a saw-fly (*Athalia*), male and female

fed, becomes a passive pupa, and within the pupa case the organs of the body break down, and are reconstructed to form those of the adult or imago. This is complete metamorphosis, defined chiefly by the fact that a period of complete quiescence intervenes between larval and adult life. In dragon-flies the difference between the aquatic larvæ and the winged aerial adults is also great, but no

Neuroptera have four similar wings with numerous nervures, the degree of metamorphosis varies. Examples, dragon-flies, June-flies, caddis-flies. Hymenoptera are insects with four membranous wings, the fore larger than the hind, metamorphosis complete. Examples, ants, bees, wasps, saw-flies. Coleoptera are insects in which the anterior wings are converted into elytra or wing-covers,

concealing the membranous hind legs, the metamorphosis is complete. All beetles belong to this order. Lepidoptera are insects having all four wings covered with scales, the metamorphosis is complete, and the adults differ from the preceding insects in having a suctorial mouth. The order is made up by the butterflies and moths. Diptera are insects with only two wings, and with a suctorial mouth, the metamorphosis is complete. All flies in the true sense belong to this order. Thysanoptera are minute insects with four narrow fringed wings. Hemiptera are insects with the anterior pair of wings more or less modified, mouth suctorial, metamorphosis incomplete or absent. Examples, bugs, cicadas, aphids.

Apart from the useful products, such as silk, honey, cochineal, etc., obtained from the insect world, insects are of importance as fertilizers of flowers, and in many cases as scavengers. Negatively, their significance as the foes of agriculture can hardly be overestimated, while medical men are just beginning to realize their importance as agents in the dissemination of disease. Another great service, however, is to make the earth habitable by preying upon their plant-destroying fellows, and a vast number of terrestrial vertebrates depend in whole or in part upon the insect world for food. The highly specialized forms, whether social or solitary, have great psychological importance.

Yet it is not too much to say that the yield of farm and orchard produce the world over—grain, fruit, roots, fibres, etc.—would be greater by a quarter, or even a third, were it not for the destructiveness of insects. Hence entomologists have long turned their attention particularly to the study of the life histories and habits of the noxious kinds, in order to learn how to combat their evil work. San Jose Scale, an insect injurious to fruit and ornamental trees and shrubs, is one of the most destructive pests that have invaded the United States in recent years. It is of Chinese origin and received its local name from its first point of appearance in America, San Jose, Cal. The insect is inconspicuous, and passes unnoticed until it has multiplied extensively, when the infested tree appears as if coated with ashes. The fecundity of the insect is enormous, a single female producing, with her progeny, 1,608,040,200 other females and nearly as many males in a single season. They have spread all over the country upon nursery stock, and are much more injurious in the East than in California

and the West. Peach orchards in Maryland and New Jersey have been destroyed in two years after attack, and even large and vigorous apple trees will succumb in six or eight years. It attacks practically all deciduous plants. See U. S. Dept. of Agriculture *Bulletin* for full details.

**Insolvency.** In law, inability to pay one's debts as they mature. It is this fact, and not the circumstance that at a given date a person may have obligations in excess of his assets, which constitutes him an insolvent.

**Insomnia, or Sleeplessness.** Total insomnia, lasting for several nights in succession, is commonly associated with certain diseases. However, victims of insomnia have a natural tendency to magnify the period of wakefulness. Sedatives and hypnotics are sometimes employed to supplement more simple measures, but should be taken only under medical supervision.

**Inspiration,** a quality attributed to writings or utterances whereby they are believed to be of divine origin and authority. Though some would identify the quality with genius, others recognize in Holy Writ something widely different from what is found in Shakespeare, Milton, Bunyan, or even the most impressive books of devotion. It is, however, easier to show what inspiration is not than to say what it is. The Old Testament prophets believed that they spoke under a divine influence, and uttered their message as the word of God. Luther exercised considerable liberty in regard to what was of authority in the Bible.

**Instalment Sales.** Sales of goods to be paid for in instalments at fixed periods after delivery. It is of the essence of such sales that the goods shall pass into the possession of the purchaser at or before the payment of the first instalment of the agreed price, but as a general rule the instalment sale vests not an absolute but only a conditional title in the purchaser, the condition being that the title shall not pass until the goods in question have been fully paid for and that the vendor may retake the goods upon default in payment of any instalment. Laws have been enacted in several American states regulating sales of this character. The convenience of this method of purchasing goods has brought it into very general use.

**Instinct** has been variously defined as untaught ability (Bain), inherited capacity for certain complex reactions of the sensorimotor (i. e. cerebral) type (Baldwin, Stout), compound reflex action (Spencer), race-habit

(Lamarckian school) From the mental standpoint, instincts may be defined as 'the faculty of acting in such a way as to produce certain ends, without foresight of the ends and without previous education in the performance' (James) Well-marked instincts are such as sucking by young animals Analysis of such instincts shows certain primary facts common to them all instinct is congenital by inheritance, not acquired by the individual, it is highly complex, involving both sensation and motion (with their mental correlates as adapted to the species-use of the instinct), though it appears as an impulse, it does not operate until the appropriate stimulus in the environment appears, it involves reflex actions both serially and in coordinated groups, it implies an inherited nervous or other organization adapted to the possible environments in the life-history of the species

Contrary to pre-evolutional views, instinct has been shown to be not always perfect in working (see Darwin's famous 'eighth chapter' in the *Origin of Species*) The Lamarckian view is that habits acquired by the individual are transmitted to the next generation, and, if useful for the preservation of the species, are continued as instincts The evidence for this view is inconclusive Consult Darwin's *Origin of Species*, Headley's *Problems of Evolution*, James' *Principles of Psychology*, Hobhouse's *Mind in Evolution*, Couch's *Illustrations of Instinct*, Marshall's *Instinct and Reason*, Cartmell's *Instinct and Intelligence* (1911), Holmes' *Evolution of Animal Intelligence* (1911), Pear's *Are There Human Instincts?* (1943)

**Institute**, an institution or society, usually of an educational nature The word is also applied to certain treatises or compilations, especially of jurisprudence

**Institute of Arts and Letters, National**, a society for the protection and advancement of literature, sculpture, painting, music, and architecture, organized in 1898 by members of the American Social Science Association nominated for the purpose Qualification for membership in the Institute is 'notable achievement in art, music, or literature' The badge is a bow of purple ribbon, crossed by two bars of gold The American Academy of Arts and Letters was organized in 1904 as an inner circle of the National Institute

**Institute of France**, the name given to a group of learned societies in France comprising the Académie Française, Académie des Inscriptions et Belles Lettres, Académie des Sciences, Académie des Beaux-Arts and Aca-

démie des Sciences Morales et Politiques They were organized at different times but all have for their object the fostering of different branches of literature, art, science and philosophy Each academy has its own independent government and the free disposal of the funds allotted to it, but the Institute has secretaries, libraries and collections in common

**Institutional Church**, a local church or congregation which lays special stress on the social and temporal side of its activities, for the elevation and amelioration of the masses Institutional churches were first definitely organized, both in the United States and in England, in the latter part of the nineteenth century The name was originally used by William J. Tucker, professor in Andover Theological Seminary, who applied it to Berkeley Temple, Boston, the first of the well equipped churches of its type, organized by Charles A. Dickinson The Open and Institutional League of New York was formed in 1894, and out of this grew the National Federation of Churches and Christian Workers, whose object is to secure united action by Protestant denominations in work commonly undertaken by all

**Instrumentalism**, in recent metaphysics, a theory of knowledge forming part of Pragmatism In essence, it is that ideas or intellectual concepts are neither pure intuitions nor translations of reality into phenomenal forms, but 'mental modes of adaptation to reality' (W. James), to wit, *instruments* for grouping sensations (experiences) into an intelligible mental fabric But thought does not arise when experiences and their reactions have come to an equilibrium, moving in habitual instinctive paths When these are interrupted by new experiences which arouse conflicting reactions, thought is called in to harmonize them and restore a new balance, and ideas that develop are its instruments Consult J. Dewey's *Studies in Logical Theory*, William James' *Pragmatism*

**Insular Affairs, Bureau of**, a division in the U. S. government Department of War organized in 1898 as the Division of Customs and Insular Affairs In 1900 the name was changed to Division of Insular Affairs and in 1902 it was again changed to Bureau of Insular Affairs The bureau has charge of all matters pertaining to civil government in the island possessions of the United States, subject to jurisdiction of the War Department It also issues annual reports of the activities and general publications in regard to

laws, claims, geographical matters, immigration regulations, commerce, tariffs, surveys, education and many other matters

**Insulin (Iletin)**, a non-toxic, aqueous extract of the islands of Langerhans, in the pancreas. It is derived from slaughter-house animals and is used in the treatment of diabetes. It is given by subcutaneous injections, which must be repeated at intervals. The discovery of insulin by Frederick Banting of Toronto in 1922 was one of the most important medical discoveries of the century.

**Insull, Samuel** (1859-1938), American public utilities magnate. Born in London, he came to the United States in 1881 as secretary to Thomas Edison, a position he retained for ten years performing invaluable service in developing the commercial possibilities of the electric light. He transferred his operations to Chicago, where he became master of the light and power industry, but pyramiding his enterprises to fantastic heights through holding companies, he encompassed the ruin of his entire structure, which went bankrupt with losses of \$750,000,000 to investors. Insull fled prosecution but finally was extradited from Greece, tried on charges of fraud and embezzlement and acquitted.

**Insurance, Accident and Health.** This form of indemnity, while in reality embodying two distinct classes of underwriting hazards, has come to be treated by insurance companies largely as a single type of coverage. The reason for this is that, while accident insurance alone is issued by many companies, only a very small number of them issue health insurance without combining it with some form of accident coverage. Life insurance companies also write health and accident insurance as additional benefits under their regular life insurance contracts. This is usually done in two ways, either through what is styled the total and permanent disability clause, covering such disability resulting either by reason of accidental injury or specified disease, or through the accidental death benefit clause providing indemnity in a lump sum to beneficiaries when the death of the assured results directly by accident. The so-called double indemnity feature is added by some companies (life, casualty or miscellaneous) and provides that double the face value of the policy shall be payable where the death of the assured occurs through accident when he or she is a passenger on a common carrier. Mutual accident and sick benefit associations, as well as some of the more important assessment life

associations and fraternal orders also write accident and health insurance either directly in the case of the first-named, or under the disability and accidental death benefit clauses.

Perhaps the most significant modern development of this form of insurance is the issuance of group accident and health insurance. This is generally issued only to groups of 25 or more persons employed by a concern and the rate is affected by the kind of business the assureds are engaged in and the number of female employees to be included. No medical examination is required and the premiums may be paid entirely by the employer, entirely by the employees, or jointly by both.

To enable the moderate premium charged for accident insurance or accident and health insurance to cover payment of losses, the risk assumed must be kept within the basis of actuarial calculations. These limits have long been debated upon and affected by a host of legal decisions. They are mostly obvious, if such special insurance is to be afforded at all, the rest being matters of ordinary good faith or experienced business need. In the last analysis, with respect to accident insurance only, these are the two classes whose exclusion constitutes the system—those not accidental, and those not violent. More specifically, they are four: (1) Those where bogus claims are easy and disproof hard, as strain, etc., with no mark on the body, and disappearance, which the small premiums and loose personal investigation have made inviting for sharpers. (2) Disease, including results of fits, vertigo, or sleep walking, and chronic conditions like hernias. (3) Medical or surgical treatment alone. (4) Results of one's own will or vice, either fraudulent, reckless, or narcotized—such as suicide or self-inflicted wounds, duels, violating the law, going to war, explorations in the wilds, etc. But this is sometimes waived when in rescue or protection of others.

A certain extension, however, of late has partially balanced these some forms of conspicuous, unfeignable, and unchronic disease, as smallpox, diphtheria, and others, have been included. But another important limitation still enters, vitally determines classifications and premium rates and furnishes another, though less numerous and serious group of disputes and suits. This is, that the injury must *disable* the insured from following his customary vocation. In the United States, the system was founded in 1863 by James G. Batterson, a Hartford builder, on the model

of the English Railway Passengers' Company. His company, the Travelers, began business in 1864, and its immediate success raised it above two dozen rivals, none of which lived more than a few years. Other lasting companies have since been formed, and old ones of other kinds have taken up this branch.

**Insurance, Casualty.** A large number of special forms of insurance are grouped together under this general title, the fundamental idea underlying all of them being protection against loss through unexpected calamity. The first form of casualty insurance to be extensively developed was Fidelity Insurance. The object of fidelity insurance is to guarantee the integrity, good faith, and honesty of an employee against misuse or misappropriation of money or property in his keeping. Title Insurance insures property owners and persons lending money on property against loss due to defective titles. Credit Insurance indemnifies manufacturers, wholesale dealers, jobbers, and others against losses through bad debts. In Liability Insurance the company, in return for a consideration, assumes the liability for injury to others. An important application of liability insurance is in connection with employers' liability and workmen's compensation. The modern development of liability insurance has centered around automobile liability coverage.

Burglary Insurance protects merchants against loss through robbery of their safes or stock, householders against housebreaking, petty theft, and larceny, and banks against safe breaking, hold-ups, damage by burglars' tools or explosives, and robbery of bank messengers. There are also Steam Boiler and Fly-Wheel Insurance policies covering loss of property and other damage due to the bursting of boilers and fly-wheels, Plate Glass Insurance for breakage from all causes except fire. Among others forms of casualty insurance may be named live stock, automobile property damage, aviation liability, teams' liability, elevator liability, golfers' and sports' liability and many other forms. Consult *Money, Banking, and Insurance* (ed by W. D. Moody), *Welson's Personal, Accident, Disease and Sickness Insurance* (1943).

**Insurance, Fire.** Fire insurance is the business of indemnifying individuals against unforeseen loss of their property by fire, in consideration of an agreed payment called the premium. Many so-called 'special lines' of insurance have come to be written by fire insurance companies such as tornado and wind-

storm, automobile fire and theft, certain hazards of aircraft operation, sprinkler leakage and water damage, use and occupancy, tourists' baggage, personal effects insurance, rent and rental values, motor vehicle contents, parcel post, rain insurance, frost and freeze insurance on crops, and others. Certain forms of protection against fire losses existed even among the commercial peoples of antiquity, especially the Romans. In its present form, fire insurance developed as an adjunct to the insurance of marine risks. As early as 1635 efforts were made in England to establish it upon a separate footing, but none of these seems to have borne fruit until after the great fire of London in 1666. This catastrophe brought home to the substantial people of the chief commercial city of the world the truth that without insurance protection no owner of property is secure against possibilities of loss so crushing as virtually to annihilate his business, and in 1667 the first office for the insurance of buildings against fire was opened in London by Nicholas Barbon.

Early in the history of fire insurance in England two distinct ideas developed as to the manner in which it should be conducted—that of the stock company, and that of the mutual. In 1687 a *modus vivendi* was established, and it was agreed that both stock companies and mutuals might lawfully engage in the business of fire insurance. In 1706 Richard Povey introduced the insurance of personal property, and by 1720 fire insurance was established in practically all the large cities of Great Britain. The first fire insurance company of importance to be organized in the United States was the Philadelphia Contributionship, a mutual organization founded in 1752. The Mutual Assurance Company of Philadelphia was established in 1784, the Insurance Company of North America, the Baltimore Equitable Society, and the Insurance Company of the State of Pennsylvania in 1794, the Mutual Assurance Company of the City of Norwich (Conn.) in 1795, the Provident-Washington Insurance Company of Providence in 1799, the Eagle Fire Insurance Company of New York in 1806, the Hartford Insurance Company of Hartford in 1810, and the Ætna Insurance Company of Hartford in 1819. By 1820 there were 17 stock companies in New York, 6 in Pennsylvania, 2 in Connecticut, and one each in Rhode Island, New Jersey, and Massachusetts. From an early period many English and Continental fire insurance companies



A GROUP OF PLANTS THAT CATCH INSECTS

1 Arctic Pitcher Plant  
4 Trillium Leaf

2 Northern Pitcher Plant  
5 Butterwort

3 Sundew  
6 Venus Fly Trap





have also been represented in the United States under laws designed to protect American policyholders, and these have transacted a considerable portion of the total insurance.

The history of American fire insurance has been characterized by the establishment of State insurance departments, regulation of rates, classification of risks, the extension of the mutual movement, the agitation for improved means of fire protection, and the employment of adjusters, moral hazard experts and special agents or field men. Fire insurance companies are of two main types: Stock Companies and Mutuals. A third type of fire insurance organization are the so-called Lloyds. There are voluntary associations in which each of the members is held liable for the payment of losses up to a specified amount, and most of these associations issue policies upon the property of members only. The business of fire insurance, like that of life insurance, is founded on the doctrine of averages in the mathematical sense of the term, yet the element of uncertainty enters into it in far greater degree. While most of the fire insurance companies are sound and dependable, sixty-four companies failed as the result of the Chicago fire, and in the decade 1870-80 forty-six companies failed in New York State, involving a total loss to policy holders of over \$35,000,000. Most of these companies were of no great reputation or standing, but the possibility of never being able to collect upon policies aroused a feeling of apprehension, which expressed itself in restrictive legislation.

Fire insurance rates are determined largely by schedules prepared on the basis of the hazards involved. Minimum rates are given to the best risks, specific charges are added for all deficiencies from the required standards, and reductions from such rates are made when the deficiencies charged for are eliminated. The rating of mercantile property is especially difficult, and a number of attempts have been made to evolve a universal schedule for rating risks of that character. The first of these, the Universal Mercantile Schedule, or some modification of it, is now used in many of the large cities of the United States. When a company orders the cancellation of a questionable risk accepted by a local agent, the latter is able to place the same risk with some other company on his list that is not so particular. The cure for this seems to lie in the direction of making the agent's compensation contingent

on successful underwriting, not on mere volume of premiums. Then, again, the greed of some fire insurance companies for business is quite as much a cause of reckless underwriting as the greed of agents for commissions.

The purpose of the leading underwriters of the country in organizing rate-making combinations is to meet the public demand for low rates while still maintaining those rates at a level consistent with sound underwriting practice. A fire insurance policy is a personal contract, insuring not the property itself, but the holder of the property against loss. Accordingly, it is essential that the party proposing the insurance should have an insurable interest in the property to be insured. Many fire insurance policies carry what is known as a 'co-insurance' or 'average' clause. This clause is a warranty on the part of the insured that the amount of the insurance in force shall be equal to a given percentage of the actual value. In case of *total* destruction, the 'average' clause has no effect, the amount collectible being limited by the amount of insurance. In case of *partial* loss the amount collectible is determined by the ratio which the insurance in force bears to the percentage of value specified in the average clause. The period during which the insurance is in force may vary from a few days, in the case of goods temporarily located in a building or warehouse, up to periods of years. The usual period is for three years, in the case of permanent property, subject to renewal at the expiration of that time or return of the unearned premium if the coverage is dropped prior to normal expiration date. One of the landmarks in the history of fire insurance legislation in the United States is the Act of the New York State legislature, passed in 1886, which led to the formation of the standard policy in that State. The New York standard policy was speedily adopted by companies everywhere, and other States passed enactments forbidding the use of any other form.

Broadly speaking, the fire insurance companies in America are limited solely to the writing of fire insurance policies, and the various 'special lines' of indemnity already enumerated. No single insurance company can, for instance, under the laws of the State of New York, issue such a combination policy as the owners of automobiles require in order to have complete protection against all the hazards to which they are subjected—fire, theft, injury to property and to persons, loss of money and of life, though fire insurance

companies normally write automobile fire and theft insurance as a joint coverage and also write automobile collision insurance, and automobile, windstorm and tornado risks. In order to get all available kinds of protection an automobile owner must carry insurance policies issued by different corporations. Some States permit companies to write all kinds of insurance, but it is a peculiarity of New York that its regulations are retroactive and a company operating there must comply with its requirements as to classes of business not only in New York but in other States, even in the State where it is domiciled. Gradually the American laws are becoming less rigid in confining insurance companies to one line and the development of 'special lines' has been rapid.

Latterly, fire prevention has assumed a prominent place in the regular work of the companies. In order to insure adequate prevention measures some fire insurance companies refuse to accept risks unless certain changes are made in the property which will lessen the danger from fire. The introduction of automatic sprinklers has been directly due to demands of fire insurance companies. Consult S. S. Huebner's *Property Insurance* (1911), Gephart's *Insurance and the State* (1913), Hedges' *Practical Fire and Casualty Insurance* (1943).

**Insurance, Industrial**, a name applied to certain forms of insurance offered to small wage-earners for the protection of themselves and their dependents, and for the encouragement of thrift. It includes Health Insurance, Workmen's Compensation, Group Insurance, and Insurance through Mutual Benefit Associations. In the United States for many years there have been in existence various forms of industrial insurance, most of them on a commercial basis, the best example being the commercial insurance company which writes an industrial policy at a small weekly premium rate, providing against sickness for the wage earner or any member of his family. Besides the purely commercial companies offering insurance of this type, many lodges and clubs have been organized, especially among the foreign element, providing sick benefits for their members. In recent years many large industrial concerns have instituted mutual benefit associations, group insurance, and various forms of workmen's compensation for their employees.

**Health Insurance**—Practically all the great industrial countries of Europe have for many years had some form of health insurance, as

well as insurance against accident (see PENSIONS, *Old Age Pensions*). In England, the National Insurance Act of 1911 provided for insurance against loss of health, for the prevention and cure of sickness, and for insurance against unemployment. Under this act and its subsequent amendments insurance against ill-health is compulsory for all employed persons between the ages of sixteen and seventy whose income is not more than £250 a year, and for every person employed in manual labor, with some few unimportant exceptions. The contributions are payable jointly by employers, persons insured, and the State, the first two consisting of weekly sums for the collection of which the employer is responsible. The second part of the National Insurance Act established a scheme of compulsory national insurance against unemployment in certain trades where that condition was of most frequent occurrence. See UNEMPLOYMENT.

In many of the States health insurance bills have been introduced, based upon standard measure prepared by the American Association for Labor Legislation. While compulsory insurance, along the lines outlined in the preceding statement, is favored by many persons and associations, there is also a strong and well developed opposition to it. Business men as a whole oppose it as unnecessary class legislation. The medical profession in general do not favor it, and neither the American Medical Association nor the American Public Health Association have officially approved or endorsed it. Organized labor, as represented by the American Federation of Labor and many of the State labor organizations, is strongly opposed to it, contending that enactment of workmen's compensation laws and the control of sanitary conditions and hours of labor constitute more adequate and better means of dealing with the problems involved.

Workmen's Compensation, which is closely allied to health insurance, compels the employer to indemnify his workmen for every injury not caused by wilful negligence on the part of the victim himself, embracing both simple compensation and also its more complex form of compulsory insurance. Workmen's compensation laws are in force in forty-two States in the United States. For a full discussion of this subject, see EMPLOYERS' LIABILITY AND WORKMEN'S COMPENSATION. Group Insurance, in its usual application, is a form of life insurance especially applicable to groups of individuals. It was ad-

vanced originally, in 1911, by the Equitable Life Insurance Society of America, but has seen rapid adoption and growth only since World War I. Technically, it is one-year renewable term insurance applied to all or nearly all of the members of a given group, usually employees of a common employer. Normal health and fairly level medium age are secured because of averages found in any group of workers. Medical examination for the insurance can be, and is, accordingly eliminated.

Reference so far has been made only to group life insurance, for group insurance has been applied chiefly to the death hazard. Recently, however, there have come into popularity group plans including health and accident coverage, insurance thrift, and group annuities—the last named representing the most recent development in the field and offering a sound and economic solution of the industrial pension problem.

**Mutual Benefit Associations**—For many years Employees' Benefit Associations have been in existence, but it is only within the last two decades that employers have become an integral part of these organizations. In the early days these associations were organized and managed by the employees. In recent years the tendency has been toward a co-operative organization between the employer and the workmen, both contributing a certain proportion to the fund, the financial benefits, however, going to the sick employee, the employer receiving his benefits from increased loyalty and a better protected working force. Today there are two main types of Mutual Benefit Associations. Those managed and financed by employees alone, those managed and financed jointly by employer and employee. See *INSURANCE, ACCIDENT, PUBLIC HEALTH, EMPLOYERS' LIABILITY, CONSULT MOCKS' Industrial Medicine and Surgery*.

**Insurance, Life** Life insurance may be defined as a guarantee on the part of the insurer, of a certain payment to the person insured, or his beneficiary in case of death or other specified event, in consideration of a pre-ent cash payment or series of payments called the Premium. During the last three decades the practice of insuring lives for the benefit of widows and children, and thus securing for these dependents a measure of relief from financial worries following the removal of the family bread winner by death, has become practically universal in civilized countries. The life insurance business has de-

veloped and expanded so as to meet the requirements of the humblest wage earner as well as of the well-to-do and prosperous, and is now a social and conserving factor of the first magnitude.

As in the case of fire insurance, the business of insuring lives originated as an offshoot of marine insurance. The first company in Great Britain to devote itself exclusively to life insurance, and to transact business on scientific principles, was the Equitable, founded in 1762. Both the sum insured and the premium were fixed at the time of making the insurance contract, the rate of premium was regulated by the age at entry, and the scale adopted was derived from the Northampton Table of Mortality. In the United States, life insurance had its beginning with the Presbyterian Ministers' Fund of Philadelphia, founded in 1759, and still in active business. The Insurance Company of North America, established in 1794, issued a few life policies, while the first actual life insurance company was the Pennsylvania Company for Insurance on Lives and Annuities, chartered in 1812. This was followed by the Massachusetts Hospital Life Insurance Company (1818), the New York Life Insurance and Trust Company (1830), and the Grand Life and Trust Company of Philadelphia (1836).

Insurance as it is conducted today, however, began with the incorporation of the Mutual Life Insurance Company of New York in 1842. In the next ten years twenty-five other companies were organized, fourteen of which are still in existence. State supervision of insurance companies began early in the nineteenth century. The first general insurance act was passed by the State of New York in 1849, and its insurance department was established in 1859, Massachusetts established its insurance department in 1855, and the other States gradually fell into line. Each State now has an insurance division, which in some cases is a distinct department, and in others a bureau of some other department, and each State has its own insurance code.

The year 1905 is a memorable one in the history of life insurance in the United States. In that year an acute controversy among the officials of one of the largest New York companies led to a request by its president that an investigation of its affairs be made by a committee of directors. Upon the publication of the committee's report, charging extravagance and mismanagement, Governor Hig-

gins of New York sent a special message to the State legislature, then in session, urging the investigation by that body of the business of life insurance as conducted within the State. A joint investigating committee, headed by Senator William W. Armstrong, was thereupon appointed, which employed as counsel Charles E. Hughes and James McKeen.

Following the presentation of the Armstrong Committee's report, a series of drastic laws were enacted by the New York legislature, limiting the expense of getting new business and of transacting old business, limiting the amount of business which can be written in one year, limiting first year agency commissions and renewal commissions, forbidding rebating, establishing the principle of non-forfeiture, forbidding syndicate participations and investments in stocks, or bonds which are wholly secured by stocks, prohibiting campaign contributions, encouraging the mutualization of stock life insurance companies. Some of these laws have since been adopted by other States.

Life insurance, when properly conducted, is not a speculative or hazardous enterprise, but an exact science, controlled and regulated by actuarial computations. The two fundamental requirements are a reliable mortality table and an assumed rate of interest to be used in computing the earning power of a company's reserves. From these two factors the net cost of the insurance, or pure premium, is mathematically figured.

**Policy Forms**—With the increasing public interest in life insurance, the companies set about devising attractive policy forms, calculated to appeal to every taste. The practice of declaring dividends to policy holders out of the profits was inaugurated, and these dividends, now declared annually, may be used either to reduce the premium, or to purchase paid-up insurance, thus considerably swelling the sum payable at maturity. The many varieties of policy now issued may be reduced to four general types: whole life policies, in which premiums are paid during the whole life of the insured, the insurance being payable at death only; limited payment life policies, in which premiums are paid during a limited period, the insurance being paid at death; endowment policies, in which premiums are paid during a limited period, the insurance being payable at death if it occur during this term, or to the insured at the end of the term, if he is living; term policies, which provide for the payment of the in-

surance at death if it occur at any time within a specified term, at the end of which the policy expires. Special forms are instalment policies, providing for the payment of the insurance in instalments, joint life policies, two or more persons being insured in favor of each other or one another, and annuities (see ANNUIITY).

When the policy holder desires to give up his policy, the company is required by law to return to him a part of the premiums he has already paid. This return, which is called the surrender value, varies from one-third to one-half of the premiums paid in ordinary cases, but it may be as much as, or even more than, the whole of the premiums, if the policy has been in force for many years, and the life insured is of advanced age. Most of the companies will grant loans on the security of their policies to an extent equal to their surrender value. The non-forfeiture law passed by Massachusetts in 1861 required the insurance companies to recognize the equities of retiring policy holders in the company funds. It was followed by similar laws in other States, and initiated the practice of allowing surrender values.

Industrial Insurance provides valuable and much-needed protection to the dependents of the small wage earner, besides encouraging thrift. The policies are issued for small amounts, the premiums are payable weekly or monthly, and are collected at the homes of the insured, instead of at the company's offices. Disability Insurance is a comparatively recent development. It may be in the form of a promise to waive payment of premiums after disability, or to mature the policy and allow its payment in regular instalments over a given period of time, or it may be in the form of a life annuity. Group Insurance, whereby employers of labor may insure large numbers of employees, without medical examination, under a single coverage, is another comparatively recent development. This form of insurance protection is particularly suited to large manufacturing and commercial enterprises, and is contributing in no small measure to a better relationship between employer and employed.

While numerous practical experiments in State-conducted life insurance have been made in the United States, none of them has been markedly successful. In connection with any successful scheme of State insurance, machinery for the soliciting of new business of equal efficiency with that of the large companies would have to be maintained, while

the attendant expense would be at least as great. It is not easy to see what substantial good would result from State life insurance at the present time. In recent years the principal American companies have entered the field of welfare work. Perhaps the leader in this field is the Metropolitan Life Insurance Company, which monthly distributes millions of documents preaching the essential truths of health conservation, and maintains a fine sanitarium at Mount McGregor, N. Y., for its employees. See *ACTUARY, ANNUITY, FRATERNAL INSURANCE*. Consult *Insurance Year Book*, M. M. Dawson's *Elements of Life Insurance* (3d ed., 1911), N. Willey's *Principles and Practice of Life Insurance* (8th ed., 1912), L. W. Zartman's *Life Insurance* (2d ed., 1914), Clough's *Century of American Life Insurance* (1946).

**Insurance, Marine.** This indemnifies for loss of ships, goods, profits of voyage, or any other insurable interest of water commerce, by perils of navigation or their indirect results. It is by far the oldest insurance in the world, fire and life risks all being, until recently, too liable to vast and unpredictable destruction. The first and till modern times the only form was the bottomry bond (see *BOTTOMRY*), where a loan in security of ship and cargo was repayable only if the ship returned safely, its loss cancelling the bond. Modern marine insurance dates from the thirteenth century in Flanders and Portugal, and probably among the Lombard merchants in Italy, who carried it to England early in the sixteenth century. The oldest extant document upon it is a Barcelona (Spain) ordinance of 1435. Three-fourths of the marine insurance of the world is taken out in Great Britain. The business is done by stock or mutual companies (alone or with other forms of insurance), by associations of individual underwriters, the oldest and chief of which is Lloyd's, or by the large shipping companies keeping a book account of insurance on their own vessels, and charging the losses against a set per cent of earnings. Lloyd's is an incorporated body with activities and relations much like the stock exchanges.

In the United States, most of the business is done by companies, which in the middle of the nineteenth century mainly controlled their home risks, but for various reasons their percentage has been heavily reduced. At all times American ships have had a good share of their insurance placed by Lloyd's or other English sources to obtain British cargoes, and at present over half the insurance and

some two-fifths of the premiums go to American branches of foreign concerns. The same form of policy is used in both England and the United States—namely, the Lloyd's. This has been in use for over a century and a half, and its retention is most advantageous to both insurers and insured, because every clause has had judicial interpretation many times over, so that each side can make a contract with exact knowledge of risks and rights. The usual term is for the voyage, between specified ports, the ship being warranted seaworthy at starting. Sometimes it is for a year or other period, without warranty.

While the fire company may always replace the lost property, the marine company never does. Another difference, peculiar to marine among all forms of property insurance, is that the anticipated profits of a voyage may be insured. The marine policy does not cover all injuries to vessel or cargo on the voyage, but only abnormal ones. It covers all navigation perils proper, as wind and wave, grounding, leaks, fire, collisions, etc., also risks of war, piracy, theft, and barratry. By custom and law, 'total loss' of ship, cargo, or freight means something beyond the common understanding of the words. When the loss is more than half the value of vessel or cargo, when the vessel is captured or embargoed, when damage to cargo obliges it to be sold at an unintended place at a loss, or when the voyage cannot be completed, so that the freight cannot be earned, it is a legal 'total loss'.

Perhaps the most distinctive single feature of marine insurance is a custom not related to insurance at all, but taken over from general maritime law—a custom almost as old as navigation itself, copied by Roman from ancient Rhodian law, and indeed intrinsic in basal justice. This is 'average' of losses deliberately inflicted on part of the venture to save the whole, that is, distributing the loss among all who are to share the profits—including, of course, the sacrificed owner. The term 'average' was long ago curiously expanded to mean any loss not averaged. Such apportionment is called *general average*, a loss borne solely by the owner is *particular average*. The policy itself usually limits the company's liability in varying degree or particular averages. Some it does not cover at all, others, only for losses over a certain (commonly five) per cent, or in special contingencies, and to fix that percentage, all partial losses at different times during the voyage are added together.

The additional risks to shipping due to the

conditions created by the First World War (1914-18) led to the creation by the U S Congress (Sept 2, 1914) of a Federal Bureau of War Risk Insurance, to insure American vessels, freight, and cargo, when it proved impossible to secure adequate marine insurance on reasonable terms from private companies, a fund of \$5,000,000 being provided for the purpose. By act of June 12, 1917, the Bureau was empowered to extend insurance to officers and seamen of American merchant ships, and by Act of July 11, 1918, to vessels of foreign friendly flags when such vessels were chartered or operated by the U S Shipping Board, or by a citizen of the United States, and to cargoes shipped in such vessels of foreign friendly flags, whether or not they were so chartered. The British government also offered war-risk insurance at special rates. Consult T Parsons' *Law of Marine Insurance and General Average* (1913), W Gow's *Sea Insurance According to British Statute* (1914), D Owen's *Ocean Trade and Shipping* (1914).

**Insurance, National** -See **National Insurance**

**Insurance, Title** See **Title Guaranty Companies**

**Insurance, War Risk** See **Insurance, Marine**

**Insurrection** See **Rebellion**

**Intaglio**, the term applied either to a method of engraving, or to a gem engraved in that particular style. Etching is one of the chief methods. In a stricter sense, an intaglio is a gem, in which a design has been hollowed out, so that, when the gem is pressed upon any soft material, such as wax, it gives an impression in relief of the nature of a cameo. Intaglio gems are of very ancient origin, and fine examples are highly esteemed as works of art. See **GRMS**

**Integral Calculus** See **Calculus**

**Integral Equation** An integral equation is an equation in which the unknown, a function, occurs in the integrand of one or more definite integrals. The theory of integral equations grew out of attempts to solve specific problems in mechanics and physics. In recent years the theory of integral equations has held the center of attention among mathematicians interested in analysis. The importance of the subject is due not only to its close connection with physics but also to its relations with other branches of mathematical analysis. Consult Bôcher's *An Introduction to the Study of Integral Equations* (1909)

**Integument** See **Skin**

**Intellect** (Latin, from *interlego*, to choose among), the faculty which discriminates sensory impressions and relates them to mental processes. In philosophy, intellect is the portion or phase of mind which thinks, as apart from that which feels and wills the mental basis of all knowledge or of beings who have knowledge, without which sensations would die with their occurrence. On the other hand, in popular use intellect means variously mental as distinguished from manual activities. *Intellection*, the process of intellectual cognitions, has had the same struggle to specialize it, with the same results. *Intellectualism* is not a system *per se*, but an emphasis in any art on the intellectual as apart from the sensuous side.

**Intelligence** has been defined as 'a general capacity of an individual consciously to adjust his thinking to new requirements.' A wide-spread use of the term has come about because of an extensive and successful employment of 'intelligence tests.' It is found that persons who do well in one mental test are apt to do well in a great variety of different tests, so that intelligence has among psychologists the practical meaning of a general capacity for success in widely diverse mental tests. A working definition of intelligence is therefore general ability in the performance of such tasks (e.g., mental tests) as demand rapid adjustment to novel requirements. Intelligence is measured by intelligence tests, the actual measure being an arbitrary score in a particular test. A more general measure is 'mental age.' Sometimes, especially for children, degree of intelligence is expressed as the quotient of mental age by physical age. This measure is called the intelligence quotient (IQ). Children brighter than the average of their age have intelligence quotients greater than one. In determining intelligence quotients for adults it has been usual to consider all adults as if they were aged sixteen.

Intelligence normally increases with mental development throughout childhood until the period of adolescence is reached. Development of intelligence constitutes the major mental change in childhood, whereas in adulthood intelligence is practically constant in an individual, and mental development takes place principally with respect to special abilities and the accumulation of knowledge. For some time sixteen was considered to be the average terminus of development, but the discovery that the average mental age of

over a million and a half adult men drafted into the U S Army was but a very little more than thirteen has led to a revision of this notion Stupid and feeble-minded persons have mental ages less than normal, but in the diagnosis of feeble-mindedness other factors than performance in intelligence tests have to be taken into account

No single mental test is ever an adequate test of intelligence for the reason that intelligence is general ability, whereas any particular test necessarily involves some kind of special ability Intelligence tests are, therefore, generally 'batteries' of various tests, each depending in part on intelligence and in part on some specific ability Special aptitudes are supposed to be cancelled out and general ability alone to be indicated by the sum of the score in all tests A recently developed type of test is that aimed to discover special aptitudes in children or adults Johnson O'Connor, director of the Human Engineering Laboratories of the Stevens Institute and the Mass Institute of Technology, originated and is still working to perfect these tests

Intelligence, as general ability, is most readily thought of as a 'common factor' entering in different degrees into a large number, or possibly all, human abilities There is no agreement as to the exact nature of this 'common factor' It has been suggested that it is a capacity for attention, and also that it represents a general available fund of 'cortical energy' All abilities involving action of the cerebral cortex would thus depend upon and be limited by the amount of the common fund of energy In animals intelligence is usually thought of as the ability to profit by experience, and is measured by the capacity of the animal for learning

The animal scale of intelligence may be roughly considered to overlap the human, although the most intelligent animals are scarcely more intelligent than the average child of three years Intelligence is frequently opposed to instinct by the opposition of the individually to the racially acquired Behavior individually acquired by learning is intelligent, whereas behavior acquired through inheritance is instinctive See **PSYCHOLOGY** *Intelligence and Intelligence Tests*, **MENTAL DEFICIENCY** Consult Binet and Simon's *Method of Measuring the Development of Intelligence in Young Children* (trans 1915), Stern's *Psychological Methods of Measuring Intelligence* (trans 1913), Yerkes and Yokum's *Army Mental Tests* (1920), *Memoirs*

of the National Academy of Sciences, *Psychological Examining in U S Army* (1920), Tucker's *Intelligence at Work* (1943)

**Intelligence Department**, one of the four co-ordinate portions of the General Staff Corps of the U S Army, which has for its functions the collection, collation, and dissemination of all necessary data pertaining to the military activities of foreign countries useful to the War Department in its peace and war functions Its head is the Director of Military Intelligence, who is also one of the four Assistant Chiefs of Staff The Positive Branch is charged primarily with the collection of information, its digestion, and study The Negative Branch has for its duty the watching of alien inimical influence at work within the army and the military sections of the government The Geographic Branch has to do with all matters pertaining to maps, preparation of tactical handbooks, etc In the American Navy Department there is a Naval Intelligence Bureau whose duties are somewhat analogous to those outlined for the army

**Intemperance** See **INTOXICATION**, **Drunkenness**, **Alcoholism**, **Delirium Tremens**

**Intendant**, the name given in France, before the Revolution, to the overseer of a province Napoleon virtually restored the intendants, but exchanged the hated name for that of prefect In the early history of Canada, the term was applied to officials sent out to watch and report to the king of France the acts of the governors

**Intent**, in law, the purpose of one who does any act on which the law may have to pass in criminal cases, the alleged culprit, in civil cases, the maker of a will or deed or either maker of a joint contract In criminal cases, the intent largely determines the legal character of the infraction itself The intent is the core of the offence, but absence of ill intent cannot be pleaded below the bounds of common intelligence In civil cases, it is really the same principle which makes the law of intent seem reversed The intent of a written instrument is judged solely by its terms, and parol evidence cannot be heard in bar or modifications, the maker is assumed to mean what he says

**Intention** See **Motive**

**Interbourse or International Securities**, a term used for stocks and shares—such as Russian bonds and American railroads—dealt in indiscriminately on the London



market, or the Paris bourse, or the stock exchanges of Germany, Austria, Holland, and New York.

**Intercalary**, (Latin, 'for insertion'), a term applied to those months or days which were occasionally inserted in the calendar to make it correspond with the solar year.

**Intercession**, in a general sense, is the act of mediating or pleading for another. The theological doctrine of the intercession of Christ—the mediation of the Saviour with God on behalf of the redeemer—is accepted by both Roman Catholics and Protestants.

**Interdict**, an ecclesiastical penalty imposed by the Roman Catholic Church, denying to the faithful, entirely (total interdict) or in part (partial interdict), the administration of the sacraments, participation in public religious services, and Christian burial. An interdict may apply to a particular place, to a special church, to a body or group of people, or to a certain person. The most notable interdicts in history are those laid on Scotland in 1180 by Alexander III, on Poland by Gregory VII, on the occasion of the murder of Stanislaus at the altar, by Innocent III on France, under Philip Augustus, in 1200, and on England under John in 1208. See **EXCOMMUNICATION**. Interdict, in Roman law, was a decree of the praetor, which generally forbade interference with the *status quo*, or ordered it to be restored.

**Interest**, the consideration paid for the use of money. It bears an agreed fixed ratio to the sum loaned, and is payable at stated intervals. The interest on \$100 for one year is called the rate per cent, the money lent, the principal, and the sum of any principal and its accumulated interest, the amount. Interest may be either Simple or Compound. Simple interest is charged on the principal alone for any length of time. Compound interest arises not only on the original sum, but also on any unpaid interest which may have been added to it, and has thus formed a new principal sum. The current or market rate of interest is determined by various causes, the chief being the relation existing between the accumulation of money and the demands of borrowers, the prevailing rate of profit on trade, and the security and duration of the loan.

Capital in ancient times was lent and borrowed not to promote business or industry, but to assist distress or relieve emergency, and the exaction of usury was regarded as taking advantage of the necessities of the poor. But with the development of modern

commerce and business that prejudice gradually died away. In the United States the legal rates of interest vary between 5 and 8 per cent in the different States and Territories, while a higher rate is frequently allowed by contract. Most of the States exact a heavy penalty for usury (see **USURY**). Consult I. Fisher's *The Rate of Interest*, Dempsey, *Interest and Usury* (1943).

**Interference**, a term referring to a very general class of physical phenomena depending on the co-existence at one place of two different sets of waves, undulations, or vibrations. Wherever wave motion occurs, as in sound, light, and other forms of radiant energy, interference phenomena may be observed. Its essential character is well illustrated by the mingling of two sets of ripples produced on the surface of a sheet of water. Where crest meets crest, and trough meets trough, there the resultant disturbance is increased, but where crest meets trough, and trough meets crest, the disturbance is diminished, perhaps even annihilated. The phenomenon of beats in sound is to be explained on the principle of interference. See **SOUND**. Interference effects in light are of great variety and beauty. Two sources of light at least are necessary, and these must be in some way derived from the same original ray. The reason of this is to be found in the great complexity of the vibration which constitutes light, and in the fact that the vibrations take place in all possible planes at right angles to the direction of the propagation of the wave.

**Interim**, (Latin, in the meantime), the name given to certain edicts of the German emperor during the Reformation for the regulation of religious and ecclesiastical matters between Roman Catholics and Protestants, until they could be decided by a general council. The chief are the *Ratisbon Interim*, at the diet held at Ratisbon in 1541, the *Augsburg Interim*, diet of 1548, and the *Leipzig Interim*, another diet of 1548. See **CHARLES V**.

**Interior Decoration** may be interpreted as the art which aims to harmonize in the interior of a building, the requirements of utility and of beauty. This interior stands in such close relation to its exterior, that the design of the one cannot well be regarded as separate and distinct from that of the other. In the greatest epochs of artistic production, architecture was the controlling spirit that determined style. The intimate relation between architecture and all the arts was very important and it is only within comparative-



Courtesy Metropolitan Museum of Art

*Upper, Modernistic Bedroom Lower, The Great Hall at Penshurst Castle, probably about 1335*

BVCI

ly recent years that this spirit of homogeneity has passed away 'Interior decoration' today has become a glib term used loosely to include any form of house furnishing and decoration

Gothic, the greatest of the Romantic styles, developing from the Romanesque, came into being during the latter part of the 12th century in Northern France, and continued to develop in Western Europe during the 13th, 14th and 15th centuries. Circles, trefoils, quatre foils, triangles, all played a dramatic part in decoration as well as in architecture. These motifs were used again and again, resulting in exquisite traceries, or in a robust form of carvings upon woodwork and furniture. Designs for brocades, damasks and embroideries were based upon these underlying Gothic forms. The finest flowering of Gothic art occurred in the 15th century, from which date remarkable tapestries, furniture and paintings became the mode. Color was introduced on frescoes and applied to sculpture. Stained glass reached its first great development in the 13th century.

The first medieval palaces were erected in the leading cities of Florence, Siena and Venice. The design of interiors came as a later development than that of the exteriors, and was not evidenced until the later Middle Ages. The thick walls and rich ceilings showed an exposed construction which presented a certain decorative effect. The ceilings were either timbered or vaulted, and more care was lavished upon their design than upon any other single architectural feature, which made of them the most noteworthy thing in the room. The salient qualities of this era's style were strength and breadth of line, largeness of scale, plain surfaces, scarcity of architectural detail—all characteristic of this mediæval, non-classic, pre-Renaissance period whose inherent simplicity and naturalness was hardly anticipatory of the rich, classic, exuberant style that was to follow.

The new style, the Renaissance, signifying a rebirth of the classic, was a return to the inherent Italian love for Latin and Lombard forms. Decoration now took first place, claiming ascendancy over structural achievement. Color was obtained through fresco painting and mosaics, which were lavishly applied to interiors. The fine and decorative arts were brought to their highest perfection, clothing architecture in finest raiment. Great artists were great craftsmen as well, and no object was too mean or insignificant for their

consideration. The Renaissance in Italy antedated its spread through France, Germany, Spain, the Netherlands and England by a hundred years. During the late Renaissance, a revolt in Italy against prevailing art traditions and against prevailing rule and order resulted in what is known as the Baroque. This effort to produce something new and 'different' developed a style complex and profuse and often lacking in restraint.

The Elizabethan style (1558-1603) following the Tudor, which developed from the late Gothic, was complex in character, because many Gothic features were retained, combined with Renaissance details. Elizabeth succeeded in creating a characteristic English style by engaging only English designers and craftsmen, who brought back from travels in France and Italy ideas for erecting great English Renaissance manor houses whose design was adapted to English country life. These great houses were the ancestors of our English and American country houses of today. They were well lighted, ample and informal and in them interior architecture found its beginning in England. The fireplace became the nucleus of the other decoration and furnishings of the room. Ceilings were treated in an elaborate manner with intricate designs in plaster. When walls were of plaster and not panelled in oak, they were hung with elaborate tapestries. Velvets, damasks, and brocades were imported from France and Italy and embossed leather from Spain.

Jacobean (1603-1649) was a transitional style covering the period that occupied the reign of Charles I. Plaster and woodwork became classically conventional and severe in comparison with Elizabethan freedom and flowering, but rich fabrics and lavish draperies and upholsteries offset the restraint of ornament and unnecessary architectural detail. The magnificence of the style of Louis XIV adequately expressed the spirit that animated the age of 'Le Grand Monarque' (1643-1715) who as patron and enthusiast raised France to an undisputed leadership in all the arts. The style influenced and was imitated by all the other countries of western Europe. Magnificence and a studied dignity, though often overloaded with ornament, achieved a fitting background for so great a monarch. Interiors and furnishings were grand and impressive, made rich and luxurious with gold, with beautiful velvets and silks and elaborate damasks, following classic models. Walls were covered with fabrics or decorated in painted leather or wood

Furniture, tapestry and rugs were superb.

The classic Renaissance principles observed by Louis XIV in decoration now yielded to the sophisticated, ostentatious period of Louis XV. There was an eager reaching out for the new which expressed the extravagance, frivolity and extravagance of social life. Decorators turned to nature but in artificial attire for inspiration and for landscapes, flowers, garlands, rocks and shells were utilized as decorative motifs and from the reiterated use of the two latter forms, the style came to be known as Rococo. Curves now took the place of straight lines in all forms of decoration, and the symmetry that dignified the preceding period disappeared. Furniture was made smaller in scale, more affected in style, and color schemes became daintier and lighter. Watteau, Boucher, Fragonard, and Lancret emphasized this lighter spirit in their remarkable decorations and paintings.

Louis XVI style was a reversion to the early classic—a return to forms and interiors whose prototypes had been unearthed at Pompeii and Herculaneum. Curved lines and exaggerations were abandoned, both in construction and in decoration in favor of an exquisite simplicity, in which proportion, symmetry and refinement reached a perfect consummation. Classic vases and urns were graceful and delicate in line. Many of these forms appeared in the contemporary English work of Adam, thus revealing a close relationship between the two. Murals, hand-blocked prints and silks were used in profusion for upholstery and hangings. Ceilings were beautifully painted and the walls were either painted or paneled in silk. It was a period perfect of its kind—and the makers of furniture, decorative printers and designers of fabrics, brought their different arts to such a high state of perfection, that they stood on a perfect equality with those artists who devoted themelves to the fine arts.

James II (1685-1688) and William and Mary (1689-1702), were deeply influenced by Dutch taste. Flat surface decoration, print and lacquer, veneer and marquetry replaced the old liking for carving. Bright color was introduced in upholstery made of needle point, damasks, or gilded Cordovan leather. Walls were treated with panels three to five ft wide, which were covered with tapestry, leather or silk.

The reign of Queen Anne (1702-1714) was a comfort-loving age. It was the age of walnut, not only for furniture but also for in-

terior woodwork superseding oak. The best known names of this period are Sir Christopher Wren, the great architect and his master-carver Grinling Gibbons.

During the reigns of George I (1714-1727) and George II (1727-1760) elaborate woodwork for wall panels and window and door trims, and large heavy mantelpieces and plastered walls were much in vogue. They were painted white, cream or some very light tint which was a distinct departure from wood in the natural, used in the 17th century. Indeed no one texture is more expressive of the change from the late Stuart drive, than this pervading whiteness.

Wall papers came into common use during the middle of the century (1756). Of Chinese origin these in landscape, flower and figures proved daring and amusing, and the craze for everything Chinese, from pottery to furniture, grew. Mahogany which was then the accepted wood for furniture lent itself admirably to carving, and Chippendale, the famous cabinet maker of the time, took full advantage of it in many of his designs.

Robert and James Adam, architects, decorator, and designers, with their preeminent influence during the second half of the Georgian period put an end to Chinese and Rococo tendencies and revived the English classic which was contemporary with the French classic of Louis XVI. Under the Adam Brothers, interiors were brought to a rare unity of design, for they were architects who not only designed the decoration for walls, ceilings and mantelpieces in their rooms, but furniture, carpets, silver, linen and all accessories as well. Though Sheraton and Heppelwhite were the two great names associated with the furniture making of the day, they were responsive to classic ideas and were glad to carry out many Adam designs.

David was the great master who dominated France after Louis XVI, and all England, except perhaps Chippendale, was affected by the change. The style known as Modern Classic now became massive and heavy and ostentatious. The wreath and laurel branch, the torch, winged figures and most of all, the crown and bee of Napoleon became conspicuous emblems. Mahogany, rosewood and ebony were employed for woodwork and furniture, and little or no carving was used.

**American Decoration**—French and English furniture was either imported, copied or adapted, crudely at first but later by expert cabinet makers in native woods. The term 'Colonial furniture' is elastically used to

signify furniture in the colonies during the 17th, 18th and 19th centuries. The late American Colonial was but another name for Empire, a type which developed in France and spread to England and then to America. Wall paper was used in the United States contemporaneously with its use in England. Cotton, linen, chintzes, silks, velvets, brocades and Eastern prints were utilized for hangings and upholsteries. Interiors associated with the Empire were rather heavy and pompous in style. With the close of the Georgian Era, the great creative period of the decorative arts ended. From that time, there have been but sporadic revivals of various past styles.

The Victorian period, beginning in 1837, introduced machine-made products and brought craftsmanship to a low ebb. It was the dark age of decorative arts. As a reaction from such an age, William Morris and his associates battled for a new awakening to the meaning of art. Sporadic attempts to create something new and different ensued and Art Nouveau in France, England and Austria and a similar movement in Germany developed. A style appeared in America called the Mission which was simple in line without any ornament to break the straight, bleak structure of furniture, which was heavy and massive in form.

Again in the late 19th century there arose a brief and feeble revolt against straight lines in favor of curves. The style of Art Nouveau has been experimented with, modified and reformed, appearing in many guises. But out of all this experimenting, something new is emerging and the Modernistic Movement is striving to create a style, whose object it is to express modern thought, modern living, modern building.

In the new interiors, various hitherto unused woods are being utilized for furniture and woodwork, which are so cut that the grain is revealed in all its beauty, and the finish is admirable. Wood, glass, metal, silks and velvets are utilized for wall coverings.

As in the past decade, the trend in interior decorating of late illustrated a definite attempt to harness the heritages of former centuries to the mood of the present. At least four major influences have made unmistakable inroads on modern interiors: (1) *Williamsburg* which is a modified revival of the early Colonial tradition, (2) *Eighteenth Century* which thoroughly mirrors the delicate grace and charm of that period in England, (3) *Victorian* which emulates the less drastic and severe lines of the latter part of

the last century, and (4) *Modern* which is illustrative of the tempo of the present era.

The *Williamsburg* is an American adaptation of the Queen Anne period. Simplicity coupled with a high degree of comfort is the keynote. Walls are ordinarily of plain white, although there is a recent swing to some of the pastel shades. Carpeting is minimized as much as possible, sparseness being a sign of smartness. Draperies and hangings are used to offset the otherwise severe tone of the room. Such as are used are required to be of the luxurious type—for example, damask or velvet. The furniture is by no means robust but nevertheless combines comfort with good appearance.

The *Eighteenth Century* motif is probably the most adaptable to the modern home and, hence, seems to enjoy the most popularity. The walls are done in a variety of themes; they are papered, paneled or even painted. No particular type of drapery is essential since silk, linen, cotton or rayon are of equally good taste. Rugs can range from the soft, luxurious Oriental to the manufactured article of the English looms. Nor need the floor coverings be of conventionalized lengths. Ovals and squares to fit awkward corners and entrances are wholly acceptable. The furniture is not as strongly ornamented as in the Georgian days.

The *Victorian* room invokes the use of ornamentation, especially in wall-paper. And the floors, too, illustrate the desire for design and figures. To relieve what might be garishness and a note of superficiality, plain draperies and simple upholstering of chairs and divans are resorted to. The furniture is usually built on the solid made-to-endure, comfortable lines. Glass decoration of all types is the theory of accessory ornamentation.

The *Modern* interior is characterized by a sweeping tempo—it is to be indicative of a state of mind, a mode of life, an urge to be and do in new fields which belongs to individuals of all ages. Walls are papered, although stippling is widely favored. Floor coverings are patterned with intricate designs. Linoleum coverings are more and more being used. Lighting follows simple and severe lines, the emphasis being on indirection in illumination. Furniture as well as accessory ornamentation is manufactured from woods and metals.

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**Interior, U S Department of the,** a department of the United States government organized in 1840, under the name of the Home Department, for the administration of certain affairs which required representation in the Cabinet. It is administered by the Secretary of the Interior, who is a member of the Cabinet, and consists of a number of bureaus and services, each presided over by a commissioner or director appointed by the President and U S Senate, and under the control of the Secretary of the Interior. These bureaus include The *Land Office*, which has charge of the location, settlement, survey, entry, and patenting of public lands. The *Bureau of Indian Affairs*, which has general supervision of education, industrial conditions, and public health among the Indians. The *Pensions Bureau*, which supervises claims for pensions and bounty land warrants. The *Bureau of Education*, which is a clearing house for educational informations. The *Geological Survey*, charged with the classification of lands, the making of topographical surveys, and the investigation of mineral and water resources. The *Reclamation Service*, in charge of the irrigation of arid lands. The *Bureau of Mines*, established in 1913, to conduct inquiries regarding mining safety and health, the prevention of waste in mining, etc. In addition to the work of these bureaus, the Department has general supervision of the Territories of Alaska and Hawaii, of the National Parks and National Monuments, of the Capitol building and grounds at Washington, of the Federal Oil Conservation Board, etc.

**Interjection,** in grammar, the part of speech that expresses excitement, feeling, or emotion, as *Oh!* or *Alas!* True interjections are complete sentences in themselves.

**Interlaken,** summer resort, Switzerland, in canton Berne, on the River Aar, charmingly situated in a plain between Lakes Thun and Brienz. There are wonderful views of the Jungfrau, Monch and the Bernese Alps and the valley is annually visited by thousands of tourists. p 3,000

**Interlineations,** in law, are words inserted in a legal instrument that materially alter its effect. In England and the United States, interlineations in a deed are presumed, in the absence of evidence to the contrary, to have been made before execution. In the case of a will, they are presumed to have been made after execution, if the will is complete without them, and to have been made before execution, if the will is incomplete without them. Material alterations or interlineations made after execution invalidate a deed, while in the case of a will they have no effect unless executed in the same manner as the will. Immaterial changes in a legal document are disregarded.

**Interlocutory Decree.** See **Decree**

**Interlude,** a name applied in the 15th century to dramas of the miracle-play type, usually performed in the banqueting halls of the great. Later the name was given to any short performance interposed between the acts of a longer play. In music, an interlude is a short voluntary played by the organist between the verses of a hymn or metrical psalm.

**Intermediate State,** the condition of the soul between death and the resurrection. Puritan and Protestant opinion generally is fairly well represented by the answer to Question 37 in the Shorter Catechism, 'The souls of believers are at their death made perfect in holiness, and do immediately pass into glory'—i.e., there is, strictly speaking, no distinct intermediate state at all. The Greek and Roman Catholic Churches, on the other hand, hold the view that there is for the dead a place, apart from both heaven and hell, where the soul awaits, or is gradually prepared for its final destiny (see **PURGATORY**).

**Interment.** See **Burial**

**Intermezzo,** Italian musical term for an interlude, a piece of incidental music played for a ballet or inserted between the acts of an opera. In Italy in the 16th century, as in the English mystery and morality plays, the intermezzo was frequently a madrigal or a chant.

**Internal Combustion Engines.** See **Oil and Gasoline Engines**

**Internal Revenue,** a term used in United States finance to designate the true tax revenues of the Federal Government other than customs duties. Including the income taxes, these revenues amount to about 69 per cent of the Federal revenue. Their collection, the enforcement of the internal-revenue laws, and the appointment of internal revenue em-

ployees rests with the Commissioner of Internal Revenue (see TREASURY, U S DEPARTMENT OF) See FINANCE, PUBLIC, TAXATION, UNITED STATES

**International, The**, more fully known as **The International Workingmen's Association**, an association of workmen founded in 1864. It had its origin in a visit of some French workmen to the London exhibition of 1862, when it was suggested by representatives of English labor that an interchange of thought and opinion on their common problems might prove beneficial. Karl Marx was asked to draw up a program and statutes, and impressed upon the new organization his own socialistic views. At a congress in The Hague, in 1872, the association broke up into two rival factions, one led by the centralist democratic socialists under Marx and the other by the anarchistic socialists under the Russian nihilist Bakounin. The latter was expelled and after a lingering existence the two organizations died away. For present day international labor organizations see LABOR ORGANIZATIONS.

**International Bank** See **World Bank**

**International Date Line**, an imaginary line drawn through the Pacific Ocean, irregularly *n* and *s*, in the vicinity of 180°, or twelve hours meridian of longitude from Greenwich, that line being selected, according to the custom of mariners, as convenient to mark the change of the date in sailing across the Pacific. On the *e* of this line the day is dated one day earlier than on the *w*.

**International Eucharistic Congresses**, gatherings of Roman Catholic ecclesiastics and laymen for the purpose of glorifying the Holy Eucharist. The first of these congresses, held in Lille in 1881, was planned by Bishop Gaston de Segur, though the original inspiration for such a meeting is said to have come from a Frenchwoman, Marie Tarnisier, a native of Tours. The second and third Congresses were also held in France, in Avignon and Liège. Among the Congresses, the eighth (1893) was especially notable as meeting in Jerusalem, and the ninth (1894) at Rheims, as being attended by a large number of delegates from the Eastern churches. The twenty-first Congress, the first to be held in the New World, convened in Montreal, in 1910, lasting from Sept. 7 to 11. During the Great War none was held, the first post-war Congress being held in Rome in 1922, and the second (the twenty-seventh) in Amsterdam in 1924. The twenty-eighth Eucharistic Congress, the first to be held in

the United States, met in Chicago, Ill. June 20-24, 1926. Cardinal Bonanza was the Papal Legate to the Congress and there were present eleven cardinals, as well as delegates from many countries. Another was held at Budapest, May 1938.

**International Labor Organization (ILO)**, an association of nations organized to further economic stability and social justice. Its seat is Geneva, Switzerland, but it has been transferred to Montreal, Canada, with a branch office in Washington, D. C.

**International Law**. International law has been judicially defined as 'that collection of usages which civilized states have agreed to observe in their dealings with each other.' It differs in three important respects from ordinary municipal law —(1) It is not imposed by any legislative authority, (2) it is not regularly interpreted by any authorized judicial body, (3) it is not enforced by any acknowledged superior power. It shares with municipal law the characteristics that it is interpreted in the light of precedent, and rests directly (as law does indirectly) on the consent of those who obey it. In all international disputes the final tribunal is war or arbitration. Some of the principal sources of international law are the opinions of experts, treaties and agreements between states, the opinions of the law officers of governments on points submitted to them, decisions in international arbitrations, and on questions of international law by the municipal courts of independent states, manuals and instructions issued by governments to their officers, and international usage. With the growth of practice and precedent, this has come to be the most important source of international law.

The unit of international law is the state, as the unit of municipal law is the individual. The essentials of a state are a populated and fixed territory, collective will and government, and independence and permanence. States may, however, be variously organized, and may, from this point of view, be classed as simple, embracing single states and personal unions, and as composite, embracing real unions, confederations, and federal unions (as the United States or Switzerland). There are also neutralized states, semi-sovereign states, protected states and protectorates. The recognition of states as independent is not to be confounded with the recognition of insurgent communities as belligerents, whereby the latter are admitted to possess the rights of war on land and sea. Where

a state is divided by domestic warfare, other states, when their interests or those of their citizens are involved in the conflict, may, if the contest appears to constitute war in the international sense, recognize the parties as belligerents and assume a neutral position

The rights of a state are (1) To organize itself as it chooses—thus the French Revolution, *per se*, did not afford a *casus belli*, (2) to act within its own dominions as it pleases, subject possibly to the limitation that its government must not be such as to constitute a scandal, (3) to occupy unappropriated territory other than the open sea, which cannot be a subject of property

In external relations the chief right of a state is that of preserving itself and defending its subjects. Thus, if a friendly state is made the base of an attack by unauthorized persons on another state, the latter may take any measures that the urgency of the case may render necessary to ward off the attack, without affording a legitimate *casus belli* to the friendly state whose territory may be violated by its action, and a citizen of one state residing in another state, though subject to the law of that state, is entitled to be protected, both in person and in property, against unlawful acts. Intervention is, unlike mediation, a proceeding which potentially involves the use of force, and, broadly speaking, is justified only on the ground of a breach of international law or of treaty, or because it is authorized or sanctioned by the body of civilized states

A formal declaration of war is no longer considered necessary to the creation of a state of war, but by The Hague Convention of 1907, a 'previous and explicit warning, in the form either of a reasoned declaration of war or of an ultimatum with conditional declaration of war,' is prescribed, as well as an immediate notification of a state of war to neutral powers. The detention of subjects of the enemy on the outbreak of hostilities is no longer tolerated by international law. They are nearly always given a reasonable time in which to withdraw, and, except in case of necessity, they are not now generally expelled. Generally speaking, an enemy should inflict on non-belligerents as little loss as is consistent with military success, and the bombardment of undefended towns for the purpose of destroying the sources of national wealth is condemned by the best authorities and is forbidden by The Hague Conventions. The following practices are dis-

countenanced by The Hague Conventions, The use of poison or poisoned weapons, the use of arms or projectiles calculated to inflict suffering out of proportion to the military advantage they secure, the use of flags of truce, or the badge of the Geneva cross, to cover military operations, the refusal to give quarter, the massacre of prisoners, the bombardment of artistic, scientific, or charitable buildings, provided they are not used for military purposes. A war may be terminated either by a treaty of peace or by the permanent cessation of hostilities. For a consideration of the rights and obligations of neutrals, see NEUTRALITY. Special topics are treated under their appropriate heads, as AMBASSADORS, ARBITRATION, INTERNATIONAL, BLOCKADE, CONTRABAND, HAGUE CONFERENCE, PRIZE OF WAR, EXTRA-TERRITORIALITY

The Council of the League of Nations appointed in 1924 a committee for the Progressive Codification of International Law, which did preliminary studies and called its first conference at the Hague in 1930. At this conference delegates of 48 member States of the League were present, as well as representatives from nine non-member States, including the United States. This permanent committee of the League was engaged in work on this branch of international relations. The Pan-American States are also working on a similar line through three permanent committees appointed first at a conference held in Havana in 1928.

The Charter of the United Nations established an International Court of Justice, composed of 15 members, elected jointly by the Security Council and General Assembly, five for a three-year term, five for six years, and five for nine years.

**International Postal Union.** In 1863 delegates from most of the great powers met in congress at Paris, and recommended various improvements in the international postal arrangements. These improvements formed the basis of the treaty of Bern in 1874, when delegates from twenty-two countries founded the Postal Union. Further congresses were held at Paris in 1878, and at Lisbon in 1885, and provision was made for a congress once in five years to revise international postal regulations. Nearly the whole of the civilized world is now included in the Postal Union.

**International Prison Congress,** which met at intervals of five years since 1870, considers questions relating to prisons and to



the criminal The whole field of crime and its prevention and repression lie within its field Consult the reports of the five-year sessions and its bulletins

**International Trade** The distinction between domestic and foreign trade is deeply rooted alike in popular and in scientific thought Public opinion regards trade with other countries in a different way from that in which it looks at inter-change between parts of the same country The former appears to be a field in which the rivalries of nations have full play, each seeking to get the better of its opponents The returns of imports and exports are supposed to need the watchful care of the state in order to secure benefit and ward off loss, while the changes in internal traffic pass comparatively unheeded Economists, also, though for totally different reasons, make a separation between home and foreign trade

The exchanges between two countries, (between citizens of those countries) are determined by differences of need for the goods exchanged The values of articles, or the terms on which they exchange, conform to the expense of producing them, and it is the difference of expense to different persons or nations that develops the system of exchange Production becomes specialized, each producer taking the work in which he has an advantage In the case of different countries this operation amounts to the growth of certain industries and the contraction or abandonment of others The course of development conforms to what has been called 'the principle of comparative cost' In order that countries may trade with each other, there must be a difference in the comparative, as distinct from the absolute, cost of production in respect to the articles that enter into the trade

The advantages resulting from foreign trade are most clearly realized by considering the growth of the system At first, only rare and much-needed articles—luxuries and, in time of famine, food—are the subject of trade Gradually, as cost of transport diminishes, fresh commodities are added to the list, until some countries receive even the bulk of their food supply from abroad, and, besides, most of the conveniences of life This expansion shows that through this means a nation obtains (1) articles which it could not produce at any cost, and (2) commodities which, if confined to home production, would be costly in the extreme, but are now procurable at moderate rates Just as important

as the foregoing is the benefit that results from the better organization of production The strongest industries of the country have more capital and labor employed in them, and the economies of large production operate in their case When, as in high agriculture and mining, increased output involves more than proportional cost, foreign trade relieves the strain in the most pressing cases by giving an outside supply There are, moreover, the social and economical benefits that follow from the interchange of ideas and methods that the close and constant intercourse of trade must produce

One influence which retards the progress of trade between nations has been mentioned—cost of transport Shipping freights and railway charges swallow up a part of the gain of exchange, and thus we see how a lowering in this element of cost opens a wider field for international commerce It may be said that trade is ever pressing against the limits set by the cost of transport Perhaps the greatest difficulty encountered in the study of international trade is that which arises from the action of money This agent is the chief cause of the errors so prevalent on the subject As transactions are generally expressed in terms of price, it is natural to regard the circulating medium as a primary influence on trade But in all trade, money is only an instrument, not a primary force The modern development of credit expedients makes the insignificance of money as an originating force still plainer Fifty years ago the balances of international accounts were met by the transmission of bullion, now international securities are available for this purpose The same consideration applies to the adjustment of prices Formerly the corrective of unduly high or unduly low prices in a country was the export or import of bullion, at present the contraction or expansion of credit accomplishes the same end more effectually The variety of currency systems has been a further cause of confusion in respect to the true place of money

This whole subject has come into steadily increasing importance since World War I and especially in the recent years of industrial and financial depression Its bearing on world affairs has been recognized by Economic Conferences, as the one in London and others, its adjustment is one of the chief features of the settlement of war debts, and its problems are recognized in the political plans of each separate nation, as well as in the series of trade agreements between dif-

ferent groups of countries recently arranged, in which the United States in 1934 is beginning to take part For further study, see information under the names of the individual nations, and under TRADE, FREE TRADE, PROTECTION, TARIFF AND TARIFF SYSTEMS

**Interpleader**, in law, is the process by which a person obtains relief when he is sued for a debt or goods in which he has no interest by two or more parties claiming against each other The process is instituted by petition, and results in an order requiring the respective claimants to litigate the matter among themselves, the property in question or its value being paid into court to await the result of the litigation

**Interpolation** is the mathematical method for calculating any required value of a varying quantity of which certain particular values are already tabulated For example, in finding his position at sea the mariner has to use the numbers which determine the sun's position at the time he makes his observation This time is given by his chronometer, and he finds the required numbers from the pages of the *Nautical Almanac* But in the *Almanac* the sun's position is given only at regular successive intervals of time, none of which will, as a rule, correspond with the time of observation He must, therefore, from the tabulated values at the nearest instants given in the *Almanac*, calculate the true values at the instant required This is done by interpolation

**Interrogatories**, in law, are written questions, put, during an action, by one party to the other, which must be answered in writing, and upon oath Their main object is to extract admissions from the person interrogated, in order to save the person interrogating from proving the facts Interrogatories will be disallowed if they are irrelevant and unnecessary, prolix, oppressive, or scandalous They are allowed in many cases, especially where it is necessary to take evidence outside the jurisdiction of the court by deposition See DEPOSITION, DISCOVERY

**Interstate Commerce Commission** was created by an act passed by the Congress of the United States and signed by President Cleveland on Feb 4, 1887, which was frequently amended, 1889, 1891, 1893, 1895, 1903, 1906, 1908, 1909, 1910, and later So amended and supplemented, an Interstate Commerce Commission of eleven members is designated, to be appointed for a seven years' term by the President, by and with the advice and consent of the Senate The

Commission has power to inquire into the management of the business of all common carriers, subject to the provisions of the act which it is required to enforce In general, the duties of the Commission are to prevent unjust discrimination by common carriers, through rebates or otherwise, as between different persons or corporations, and to secure reasonable and just transportation charges Through its regulatory powers it has come in recent years into a much wider sphere of influence and effect than was originally contemplated, as, for example, in the matter of child labor

**Interval**, in music, is the difference between two notes of unequal pitch The smallest interval used in practical music is a semitone, and in tempered intonation all semitones are of equal interval The modern chromatic scale consists of 12 consecutive notes of different pitch, which, beginning with the tonic or keynote, are each a semitone higher than the preceding note All other scales are constructed from these 12 semitones The number of semitones contained in the interval between two notes of different pitch determines the size of the interval, but the numerical name depends on the number of degrees of the scale included Thus, though the interval C to E contains 4 semitones, it is termed a third, because it includes only three degrees of the scale—C, D, E Intervals calculated upward from the tonic to the other degrees of the major scale are *major* (seconds, thirds, sixths, and sevenths) and *perfect* (unisons, fourths, fifths, and eighths) Major intervals lessened a semitone become minor, minor and perfect intervals lessened a semitone become diminished, and major and perfect intervals increased a semitone become augmented Intervals larger than an octave are termed compound a second with its upper note an octave higher becomes a ninth, a third becomes a tenth, etc All intervals are either consonant or dissonant Unisons, fourths, fifths, and eighths are perfect and consonant when in their primary relationship to the tonic or keynote of the major scale, they become imperfect and dissonant when augmented or diminished Major and minor seconds, major, minor, and diminished sevenths, are all dissonant, major and minor thirds and sixths are consonant, but when augmented or diminished become dissonant

**Intestacy** The act of dying intestate—without having disposed of all of one's estate, real and personal, by will There may

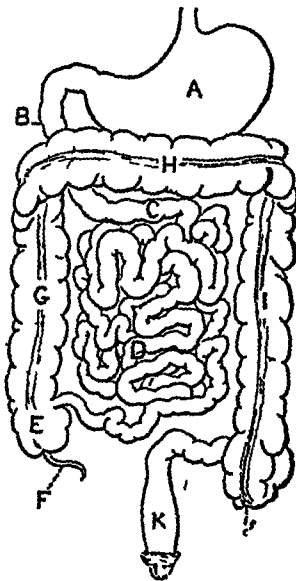
therefore be a partial intestacy, where a will leaves certain property undisposed of, whether through the lapse of a devise or through failure to include devisable property in the will. Intestate property passes to the heir, if real, and to the executor or administrator, if personal.

**Intestines** The intestine, or bowel, is that part of the alimentary canal which, commencing at the pyloric end of the stomach is coiled in the abdominal cavity and ends at the anus. Although a single continuous tube, for purposes of description it is divided into various parts. Food leaving the stomach passes first into the duodenum, then into the jejunum, and later into the ileum. These three portions form the small intestine, which in man is about 20 ft in length, but this is subject to great variations. The lumen of the small intestine is larger at its upper end, and

process, the vermiform appendix, which is a rudiment of a much larger structure occurring in the lower mammals. The cæcum is continued upward as the colon which is described as (1) ascending, (2) transverse, and (3) descending. The sigmoid flexure lies between the descending colon and the rectum, whose lower opening, the anus, is guarded by a strong circular muscle, the sphincter ani. The large intestine, instead of being smoothly cylindrical, like the small, is arranged in a series of pouches, and has a much larger lumen.

The intestines are covered by a serous membrane, the peritoneum, and are loosely attached to the spine by the mesentery. Within the peritoneal covering are muscular and mucous coats. The muscular coat is arranged in two distinct layers, an outer longitudinal and an inner circular. During life the muscular fibres exhibit peristaltic contraction, the upper fibre contracting before the lower, so that the intestinal contents are constantly pushed onward by the wave-like narrowing of the active bowel. In the mucous coat are numerous glands, some of which secrete the intestinal juices. The intestinal secretions are augmented by those of the liver (bile) and pancreas, which have a common opening into the duodenum. The interior of the small intestine is characterized by the presence of villi, which are minute projections into the lumen of the bowel. Each villus is covered by mucous membrane, and contains the commencement of a lacteal vessel, by means of which digested food is absorbed and transmitted through the lacteals to the blood stream. Some of the material absorbed passes to the liver by the portal vein (See DIGESTION). The large intestine contains no villi. The bowel is abundantly supplied with blood and lymph vessels, which reach it through the mesentery, and the intestinal nerves are derived from the sympathetic system. The processes of intestinal digestion will be found described at DIGESTION.

From the interdependence of different organs, the alimentary system is peculiarly prone to be deranged as a secondary result of disease elsewhere. The converse is also true. Fermentation of food retained in a disordered intestine gives rise to toxins that are carried about the body in the lymph and blood, causing headache, depression, irritability, etc. The immediate nerve supply of the bowel is derived from the sympathetic system, through which mental strain frequently produces intestinal symptoms, such



*General Diagram of the Intestines*

a, Stomach, b, duodenum, c, jejunum, d, ileum, e, cæcum, f, vermiform appendix, g, ascending colon, h, transverse colon, i, descending colon, j, sigmoid flexure, k, rectum

gradually narrows as it goes downward. The opening of the ileum into the cæcum, the first part of the large bowel, is valvular, and this arrangement prevents any passage backward of the intestinal contents. Beyond the ileo-cæcal valve the cæcum forms a large dilatation, and from it springs an elongated blind

is diarrhea, suppression of the normal secretions, or generation of large quantities of flatus. From their anatomical structure and relations, the intestines are liable to a special class of accidents which are largely the result of their mobility and muscularity. Thus, volvulus (twist), intussusception (invagination), and hernia (rupture) are frequent displacements, and numerous others are produced by the traction or by the pressure of other organs and of tumors, or by adhesions resulting from peritonitis. From the diversity of the tissues which form the intestinal wall, the bowel is subject to the development of numerous varieties of new growth, many of which are malignant. Inflammatory conditions of the bowel are common, and present many types. Enteritis may be acute or chronic, and it may affect the whole bowel, but is more often localized, in which case such a name as duodenitis or colitis is used to designate the part affected. Appendicitis may result from the impaction of a foreign body (a rare condition), or from the irritation of a fecal concretion, and inflammation in this site is specially liable to lead to abscess formation around the appendix. In other cases intestinal inflammation may terminate in ulceration, which may also be a consequence of new growths, and of the specific poisons of diseases like tubercle, dysentery, and typhoid fever. Ulceration may lead to severe hemorrhage and to perforation of the bowel. Intestinal obstruction may be produced by malformation (congenital), by internal or external strangulation of the gut, by the impaction of gall stones, foreign bodies, or fecal accumulations, by constriction of the bowel through cicatricial contractions or new growths, and by the compression of tumors.

It is, in short, often a symptom of constipation. Hemorrhage may be the result of ulceration or of vascular growths in the bowel, or it may be caused by such blood diseases as leucocythemia and purpura hemorrhagica. Intestinal obstruction high up is generally marked by diminution in the secretion of urine or even by suppression.

Treatment of intestinal derangement may be either expectant or active. In many of the slighter disorders it is sufficient to procure physiological rest of the bowel so far as that may be done by a moderate degree of starvation, or by giving a limited supply of foods which are easily absorbed. All sources of irritation, such as indigestible or fermenting food, parasites, and hardened feces, should be removed from the bowel by purgatives, by anthelmintics, or by enemata. Pain may be controlled by hot fomentations. In the graver intestinal diseases more active measures must be adopted, and the care of the patient by a physician is necessary.

**Intonation**, in plain song the two or more notes leading up to the dominant or reciting tone of a chant or melody, and usually sung by only one or a few voices. It is generally confined to the first verse of each psalm or canticle, but in singing the *Mass*, *Gospel*, *Benedictus*, and *Credo* the priest or chorister sometimes sings the opening phrase of each successive verse.

**Intoning**, the uttering of a liturgy in musical recitative. This may be either in monotone, or more usually with harmonized intonations. The rubrics of the Church of England and the Protestant Episcopal Church in America direct that several parts of the prayers shall be 'sung or said,' and intoning is often preferred.

tion and circulation so depressed as to endanger life. Intoxication caused by other agents than alcohol generally produces similar results—viz: an initial exhilaration, followed by blunting of the higher faculties and subsequent depression of the vital nerve centers. The symptoms are caused partly by dilatation of the cerebral blood-vessels, and partly by the direct effect of alcohol on the brain cells. The preliminary exaltation is chiefly due to the increased blood supply of the brain, while the graver degrees of intoxication may be referred to the toxic action of alcohol on the nerve cells.

**Introduction**, in music, is a preliminary section which frequently precedes various forms of musical composition and is almost invariably present in overtures. It may consist of a single chord or of a succession of chords, or it may contain a number of passages either differing entirely from, or somewhat similar in nature to, what follows. In some of the earlier operas the whole of the first scene was termed an introduction.

**Introit**, the verse, psalm, or hymn which is sung as the priest goes up to the altar. It consists in the Roman Catholic Church of an antiphon, gloria, and part of a psalm or other passage of Scripture. Being sung as the priest enters within the precincts of the altar, it was named the Introitus.

**Intuition**, in its most general sense, signifies immediate perception or insight, as contrasted with discursive reasoning. From this two special meanings branch out, according as we refer to an immediate knowledge below the level of reasoning (direct perception by the senses), or an immediate knowledge above the level of reasoning, insight into those fundamental and self-evident truths which, so far from requiring to be proved by reasoning, are themselves the basis of all reasoning and proof—as, for example, the axioms that every event must have a cause, and that the same cause will have the same effect (uniformity of nature). The word is far more frequently used in the second sense, and 'intuitionism' is used in this sense as the designation for the view, alike in theory of knowledge and in ethics, that certain self-evident axioms are presupposed as the basis of all reasoning and reasoned knowledge, whether speculative or moral.

**Intussusception**, or **Invagination**, a condition occurring most frequently in children under one year of age, which results when one part of the intestine passes in telescopic fashion into another. The condition

leads to obstruction of the bowels, with consequent acute pain, vomiting, and diarrhea. Prompt surgical interference is generally imperative. Purgatives can only increase the mischief. Operation should be performed before there has been time for peritonitic adhesions to form, or for gangrene to set in.

**Inula**, a genus of hardy herbaceous plants of the order Compositæ. *I. helenum*, the elecampane, is naturalized in the United States.

**Invalides**, Hôtel des. See Paris.

**Invar**, an alloy of nickel and steel (36 per cent nickel) discovered by Dr C E Guillaume. On account of the small percentage of variation in its volume from changes of temperature it is suitable for delicate instruments, such as those used in geodetical surveying.

**Invasion**, the warlike entry of an army into an enemy's territory. The legal rights conferred on the invader by international law are limited to the rights of military occupation. The modern view is that the rights of an invader are limited to doing such acts as are required for his safety and necessary for the purpose of bringing the war to a successful conclusion. The national character of the territory and people invaded remains unchanged, and the fundamental institutions and the general laws affecting property and private personal relations are not altered, but the invader nevertheless temporarily assumes absolute authority to do what is necessary to protect his army and attain his end. Because of the absolute authority temporarily assumed by an invader, it is his duty to secure public order, and because of the limited nature of his rights, it is his duty to refrain from doing wanton damage.

**Inventions** are concepts of things useful which have had no previous existence, distinguished, therefore, from discoveries, which are things previously existent but previously unknown. The new idea constitutes the invention, but an invention becomes patentable only when such a concept has been embodied in physical form, and the object made is then also called invention. The elements used may be new or old, provided that, if old, they are so reorganized as to constitute a new result. An invention, to be patented, must be useful, but in the United States it need not be subsequently manufactured. In 1910 an Inventors' Guild was formed in New York to further the interests of inventors and the progress of invention, specifically, to improve conditions in the U S Patent Office, and to effect reforms in the patent laws.

The membership, limited to fifty, includes many prominent American inventors.

**Inventory**, a formal list of items of personal property, sometimes with the actual or estimated value of each item set over against it. An inventory may be an ordinary incident of commercial business, or it may be required by law as an incident of legal proceedings. It is thus required of executors and administrators on taking possession of a decedent's estate, of bankrupts and insolvents or their assignees or trustees, of receivers of corporations, of the guardians of infants, and of others acting in a fiduciary capacity. In all such cases the inventory is filed in court, and becomes the basis of the accounting, in which the executor, assignee, or receiver must subsequently make before being discharged from liability. See **EXECUTOR**.

**Inverary**, town Scotland, Argyllshire on the n.w. shore of Loch Fyne, 45 m. n.w. of Greenock. To the n.w. is Inverary Castle, the seat of the dukes of Argyll, p. (1921) 190.

**Invercargill**, chief town of Southland, South Island New Zealand. It is the usual starting point for Southern Lakes. Among notable edifices are the government buildings and the new municipal theatre and town hall. The chief industrial establishments are rope and twine, carriage, implement, bacon furniture and boot factories, flour, wool, and saw mills, iron foundries, and brick and pottery works. The bluff harbor has been greatly improved and a secondary harbor established in the New River estuary. There is considerable trade, p. 110.

**Inverness**, seaport Scotland in Invernesshire, beautifully situated near the mouth of the River Ness and at the junction of the Beaulieu and Moray Firths. It is called the Capital of the Highlands. The Caledonian Canal passes about a mile from the town. The types of interest include the Episcopal Cathedral, Cromwell's fort (1652-57) and the Royal Academy. The chief industries are whisky, brewing, distilling, iron foundry,

counties in Scotland and has an area of 4323 sq. m. The surface is extremely mountainous. Among the loftiest summits are Ben Nevis (4,406 ft.), the highest peak in Great Britain, Braemar (4,175 ft.), and Curness (4,084 ft.). Among the more important lakes are Loch Ness, Oich, and Lochy, in the course of the Caledonian Canal, Ercht and Luggan, in the e., Shiel in the w., Fli and Arslug to the w. of the Caledonian Canal. About five and a half per cent. of the county is under cultivation, but the greater part is covered with deer forests and moor, mostly leased for hunting. Sheep farming is extensively carried on, but the most important industry on the west coast is herring fishing. The chief town is Inverness.

**Invertebrates**, a general term applicable to all animals not having a spinal column. The chief divisions of invertebrates are the Protozoa, Porifera, or sponges, Coelenterata, unsegmented worms, segmented worms (annelids), Echinodermata, Arthropoda, Mollusca.

**Investiture**, in feudal and ecclesiastical law, is the act of giving possession of a manor, office, or benefice—usually with the ceremonial delivery of some symbol of the rights conferred. In the feudal land law, the act of investiture consisted in the formal act of placing the tenant in possession of the property. At an early date the term investiture came to be confined to the conferring of benefices and other temporalities on ecclesiastics, and in this connection it played an important part in one of the greatest controversies between church and state in the Middle Ages. Temporal sovereigns claimed the right of investing a bishop with the temporalities of their sees by the giving of staff and ring—a right which, after a bitter struggle between the pope and the emperor during the eleventh and twelfth centuries, was at length successfully resisted by the pope. At the Concordat of Worms (1122) the emperor Henry V. agreed to confer investiture by the touch of the scepter only, the pope im-

is no sound place for the speculative intent in a plan of investment of funds which are vital to the stability in life of the individual. Types of investments may be summed up as follows: (1) Investment in gilt edge securities, such as preferred stock, or first mortgage bonds, or government bonds. (2) Investment in first mortgages on real estate. (3) Investment in building loans. (4) Insurance. (5) Custodian trusts. (6) Investment trusts. Let it be set down as a fundamental that all investments should be considered very carefully in detail by someone with experience in investments—a bank or a banker or an analytical and seasoned business man who knows investment pitfalls.

It is a second fundamental that promotion stocks or securities should be avoided by all but business men who have personal knowledge and experience with the type of business represented, and who would feel no serious loss of their money in such promotion enterprises. A third fundamental principle is that the rate of interest on an investment is in precise ratio to the amount of risk of the capital. It is true that this ratio has been changed in the past decade or two, but the principle remains fundamental. Common stocks, especially those of 'no par value,' are in a class by themselves, as they are not limited to a specified interest rate of return, and are also often without any interest return until the company is able and willing to declare a dividend.

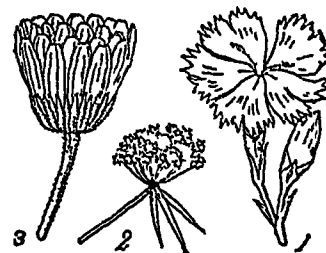
First mortgage bonds are a first lien upon all the assets and property of a company and take prior claim over any other security. Government bonds are frequently good investments, although some government bonds do not yield as high a return as some of the public utilities and industrials. The high class preferred stock is best adapted not for the purpose of a quick sale and turnover, but rather to hold for a long period and obtain a steady dividend therefrom. Insurance has in it investment features. The endowment policy, for instance, for a ten, fifteen or twenty year period, does several things which benefit an investor. First, it creates for the person acquiring the policy, an immediate estate in the amount of the face amount of the policy. Second, it operates as an assurance of income in case the person becomes incapacitated, also when the policy is taken in a good participating company, return dividends far in excess of what that same sum of money could earn if put into some other type of security, are often

available. For the person who 'cannot save' insurance is an excellent compulsory method.

In these days, with so many investment firms, bank investment services, so many periodicals and papers available for analysis and study of all types of securities and investments, no investor need act in ignorance. If he will only study the situation thoroughly, make a common sense decision as to the kind of investment which best fits his purse and his needs, what will give him the maximum security and profit, the chances are not likely to be against him—particularly if he keeps away from those investments which have no record of stability or profit. Finally, the investor should never look for 'enormous' profits, but be content with a good return on a safe investment and safety of principal involved.

#### Invincible Armada. See Armada

**Invoice**, a written memorandum of articles shipped to a purchaser or consignee and the charges therefor. In the case of foreign goods billed to the United States, the invoice must be verified by the American consul before shipment.



*Involucre*

1, Pink, 2, fool's parsley (partial involucre), 3, marigold

**Involucre**, a whorl or verticil of bracts arranged round the base of an umbel or capitulum or of a single flower. The pink, dogwood, fool's parsley, and marigold are good examples.

**Involution**, an arithmetical and algebraic operation, which consists in raising a quantity to any given power. The inverse operation, or the extraction of a root, is called *evolution*. The distinction is of importance in arithmetic, but in algebra the two operations are included in the general method of indices, integral and fractional. When the power or index is a whole number, the process of involution gives one quantity from each given quantity. Thus  $10^2$  is 100, and there is no other quantity. On the other hand, the extraction of a root gives alge-





about 500 B.C., then by Harpagus, general of Cyrus, in 545. In 500–499 they revolted from the Persians, but were again subdued in 494. The defeat of Xerxes left them free to join Athens in a league, in which eventually they became her subjects. This league was formed in 477, and dissolved by the defeat of Athens in the Peloponnesian War in 404. Thereafter except for a renewal of the alliance with Athens from 378 to 357 B.C., the Ionian cities were autonomous, until they became merged in the kingdom of Alexander and his successors.

**Ionian Islands**, an irregular chain of islands (area 1,115 sq. m.) extending along the western coast of Turkey and Greece, and including Cerigo, Corcyra or Corfu (the most important), Paxos, Santa Maura or Leukas, Ithaca (of the *Odyssey*), Cephalonia (the largest), and Zante. They are generally mountainous, with plains and valleys of exceptional fertility, yielding grain and fruits, particularly currants. Oil, soap, wine and currants are exported. The towns lie mostly along the eastern coasts. Hellenic, Byzantine (till 1081), Venetian (1368–1797), French, and Russian rule successively held sway till, in 1809–15, the islands came under British protection. They were ceded to Greece in 1864. In January, 1916, during World War I, Serbian troops were stationed there for recuperation after their retreat before the Austrian advance, and later in the year Corfu was the seat of the Serbian government, p. about 226,590.

**Ionian Sea**, that part of the Mediterranean which lies between Italy and Greece, south of the Adriatic.

**Ionic Order**. See *Architecture, Classic Orders*.

**Ions**, the term given by Faraday to the components of chemical compounds set free by electrolysis, these being distinguished as anions if set free at the positive pole, and cations if at the negative pole. Ions were at first thought to be freed only by the passage of the electric current, but the theory advanced by Arrhenius, in the latter part of the nineteenth century, maintains that an electrolyte in aqueous solution also undergoes of itself considerable molecular dissociation into ions—a dissociation which increases with the degree of dilution, and which is conceived to be complete when the dilution is infinite. Radium and the X-rays are also ionizing agents. The ion has been shown to be charged with electricity in a fixed and invariable amount or multiple

thereof. A solution of hydrochloric acid is believed to contain chlorine and hydrogen ions having properties quite different from those of chlorine and hydrogen gases, because existing as single atoms charged with electricity, instead of, as ordinarily, electrically neutral molecules. When, in electrolysis, charged electrodes are introduced into such a solution, the negative ions are carried to the positive pole, and the positive ions to the negative pole. Prof. R. A. Millikan succeeded (1910–11) in isolating the ion and calculating its value, which he states numerically as the absolute electrostatic unit multiplied by  $4.93 \times 10^{-10}$ .

See *DISSOCIATION, ELECTROLYSIS, ELECTRON, SOLUTIONS, VACUUM TUBES*. Consult Crowther's *Ions, Electrons, and Ionizing Radiations* (1929).

**I O O F**, Independent Order of Odd Fellows. See *ODD FELLOWS*.

**IOU**, a written acknowledgment of a debt in which the letters IOU are used for the words *I owe you*. The common form is 'To Mr. A. B., IOU \$20—C. D., Jan. 1, 1935.' As an IOU contains no promise to pay, it is not a negotiable instrument, but it is good evidence of an account stated between the parties.

**Iowa**, (popularly called 'Hawkeye State'), one of the North Central States of the United States. It is bounded on the north by Minnesota, on the east by Wisconsin and Illinois, on the south by Missouri, and on the west by Nebraska and South Dakota. It has an area of 56,147 sq. miles of which 55,586 are land surface.

**Topography**—The surface of Iowa is undulating prairie, sloping gently from the n.w. corner toward the s.e. The average elevation is somewhat more than 1,000 feet above sea level. The surface is unusually smooth, even for a prairie country, the only rough places being the steep bluffs along the river, and the fantastic dolomite crags near Dubuque. Fully two-thirds of Iowa drains directly into the Mississippi River, which forms the whole of the eastern boundary, and the remainder into the Missouri, which forms most of the western boundary. The highland dividing the two drainage systems runs across the State irregularly n.-n.w. from a little w. of the centre of the southern border. The principal tributaries of the Mississippi are the Des Moines, Iowa, Turkey, Wapsipicon, Cedar, Maquoket, and Skunk Rivers. Flowing into the Missouri are the Big Sioux, on the western border, the Rock,

Floyd, Little Sioux, Boyer, West Nishnabotna, East Nishnabotna, and Nodaway Rivers. Among the numerous small and beautiful lakes in the north-central part of the State are Spirit, Okoboji, Clear, Palo Alto, Swan, Butler, and Storm Lakes, several of which are popular health resorts. Pines and cedars and some deciduous trees grow on the river bluffs.

**Climate and Soil**—The comparative topographical uniformity of Iowa results in a homogeneous climate. The mean temperature at Des Moines is  $17^{\circ}$  in January and  $75^{\circ}$  in July, and at Keokuk  $23^{\circ}$  in January and  $77^{\circ}$  in July, the extremes are  $109^{\circ}$  and  $-24^{\circ}$ . The mean annual temperature is about  $47^{\circ}$ . The average annual rainfall is about 35.5 inches, falling chiefly in summer. The surface soil of almost the entire State is

coal of the Missouri stage of the Pennsylvanian in the southwestern portion of the State. Many of the shales are excellent materials for brick, tile, other clay wares, and cement. The limestones of Devonian, Mississippian, and Missourian ages are of good quality for Portland cement, while the Permian and Mississippian strata contain valuable beds of gypsum. The coals are bituminous and non-caking, lying for the most part in beds of about five feet in thickness and in basin-like depressions. The sandstones of Cambrian and Ordovician ages, furnish large supplies of water particularly in the eastern counties.

**Mining**—Iowa ranks twenty-eighth among the United States in mineral production, third among the States in gypsum production, and thirteenth in coal output. Coal



*Cornfield on an Iowa Farm*

glacial debris, or till, the covering being from 15 to 20 feet, with small areas reaching 200 feet. It is quite free from boulders, shows no typical moraines, and is everywhere fertile, particularly the drift of the great stretches of prairie and the alluvial soil of the river bottoms. The drift is black loam of sand, silt and clay, which is easily worked and is of unsurpassed fertility. The glacial drift, which covers all but a portion of the ne corner of the State, consists of five sheets—the oldest of which, the Nebraskan, probably covered the entire State. The Rock strata beneath the drift are chiefly of Paleozoic age. These form broad bands, ranging in age from the Cambrian sandstones of Northeastern Iowa, through the Ordovician limestones, sandstones and shales, the Silurian limestones, the Devonian limestones and shales, the Mississippian limestones and shales, and the sandstones and coals of the Des Moines stage, to the shales, limestones, and

mining is the leading mineral industry of Iowa. The coal area is part of the Western Interior Coal Field, extending over the south-central and southwestern parts of the State, and comprising about 19,000 sq. m.

**Agriculture**—The exceptionally rich and fertile soil and plentiful rainfall, especially during the crop months, render Iowa one of the leading agricultural States in the Union. Cereals are the principal agricultural crop. The acreage and production of the leading crops annually averages about as follows: corn, 10,306,000 acres, 468,923,000 bushels; oats, 5,913,000 acres, 198,086,000 bushels; barley, 447,000 acres, 12,963,000 bushels; wheat, 584,000 acres, 9,586,000 bushels; hay (tame and wild), 3,083,000 acres, 4,997,000 tons; rye, 101,000 acres, 1,566,000 bushels; potatoes, 58,000 acres, 5,684,000 bushels; soy beans (for beans), 294,000 acres, 5,733,000 bushels, and soy beans (for hay), 618,000 acres, 927,000 tons. Iowa leads all the States

in the United States in the production of oats and of corn. The cultivation of vegetables receives considerable attention. The chief fruit crop is apples.

**Stock Raising**—The extensive agricultural resources of Iowa are the basis for its large stock raising industry. It surpasses the other States in the number of swine and of horses. The number of the livestock in 1941 were estimated as follows: swine, 8,000,000, horses, 750,000, cattle, 5,000,000, sheep, 2,000,000, mules, 54,500. Dairy products, milk, cream, cheese, and home-made butter, also poultry, eggs, garden truck, and wool, are of great importance. There were 200,000 automobiles, 20,000 trucks, and 110,000 tractors on Iowa farms.

**Manufactures**—With abundant coal, excellent railway transportation facilities, and large supplies of various kinds of raw agricultural products, the manufactures of Iowa increased at a rapid rate in the first quarter of the twentieth century. By far the most important industries are those connected with the agriculture and livestock resources of the State. Slaughtering and meat packing rank first, the second product in value is butter. Manufactures include a large variety of products, including washing machines, wringers, driers, and ironing machines for household use, railroad-shop construction and repairs, bread and other bakery products, engine turbines, and water wheels, foundry and machine-shop products, planing-mill products, flour and other grain-mill products, cement, canning and preserving, gas, and furniture. Sioux City is the most important manufacturing centre of the State. Des Moines, which ranks first in population, stands second as a manufacturing center.

**Transportation**—The principal means of transportation are the railways, though the Mississippi is of considerable importance to the cities on its banks. Railway construction began in 1854, and was carried on rapidly until 1900. The extensive mileage is in part due to the great number of trunk lines that pass through the State.

**Population**—According to the Federal Census of 1940, Iowa has a population of 2,538,268, an increase of 67,329, or 2.8 per cent in the decade 1930-1940. Of the population, the foreign-born whites comprise 6.7 per cent. The urban population, in places of more than 2,500, is 42.7 per cent of the total. The largest cities in 1930 were Des Moines, 159,819, Sioux City, 82,364, Davenport,

port, 66,039, Cedar Rapids, 62,120, Waterloo, 51,743, Council Bluffs, 41,439, Dubuque, 41,892, Ottumwa, 31,570, Clinton, 26,270, Mason City, 27,080.

**Education**—The chief executive of the public school system is the Superintendent of Public Instruction, chosen every four years. There are also county superintendents. School attendance is compulsory for twenty-four consecutive weeks during each school year for children of school age (seven to sixteen years). In 1930 the population of school age numbered 744,533, the enrollment in the public schools was 571,228. Iowa has the highest rank of all the States in literacy (99.2 per cent). Institutions for higher learning include the State University of Iowa, at Iowa City, Iowa State College of Agriculture and Mechanic Arts, at Ames, Iowa State Teachers' College, at Cedar Falls, Coe College, at Cedar Rapids, Drake University, at Des Moines, Grinnell College, at Grinnell, Parsons College, at Fairfield, Simpson College, at Indianola. The School for the Deaf, at Council Bluffs, and the School for the Blind, at Vinton, are under the State board of education.

**Government**—The present constitution of Iowa dates from 1846. It was revised in 1857, and since then only a few minor changes have been made. The question of revising and amending the constitution is voted upon at the general election every ten years. A majority vote in two successive legislatures, followed by approval by the State electors, is necessary for an amendment. The General Assembly, consisting of a Senate and a House of Representatives, holds biennial sessions. Elections are held every two years for the House of Representatives, and at the same interval for one-half of the Senate, the term of a senator being four years. The House consists of not more than 108 and the Senate of not more than 50. The Governor, Lieutenant-Governor, Secretary of State, Auditor, Attorney-General, Superintendent of Public Instruction, Treasurer, and Secretary of Agriculture are elected for terms of two years. The Governor may convene the General Assembly by proclamation. The House of Representatives has the sole power of impeachment before the Senate, which constitutes a court for the trial thereof. The Supreme Court is composed of a Chief Justice and eight Associate Justices, elected for terms of six years. There are twenty-one District Courts, and four Superior Courts.



one in operation, the University was reorganized in 1860, the Law Department was established in 1868, the Medical Department in 1870, the Homœopathic Department in 1876 (united in 1919 with the College of Medicine), Dental Department in 1882, Pharmacy in 1885, the Graduate College in 1900, the College of Commerce in 1921 and the Division of Physical Education in 1924. The University is a part of the public school system of the State.

**Ipecacuanha**, (Ipecac), a plant (*Cephaelis Ipecacuanha*) of the order Rubiaceae indigenous to the damp, shady forests of Brazil, Colombia, and other parts of South America, valuable for its root, which is employed in medicine. It is a trailing plant, with a slender, prostrate stem bearing a few oblong, lanceolate leaves, small white flowers, and purple berries. The plant is seldom cultivated, but is gathered by the native Indians, who uproot the entire plant. The powdered root of ipecacuanha contains from two to three per cent of the alkaloids *emetine* and *cephaeline*, which are the active principles, besides a large amount of starch. Ipecacuanha is used in the form of either powder or wine. In small and repeated doses it increases the activity of the secreting organs, especially of the bronchial mucous membrane, and of the skin.

**Ipek**, town, Yugoslavia, on a head stream of the Drin, in the vilayet of Kosovo. The environs produce fruit, mulberry, and tobacco in abundance, and the place is a centre of the silk industry. There is a manufactory of arms. Until 1690 the famous monastery was the residence of the Serbian patriarchs, p. about 15,000 mostly Mohammedans.

**Iphicles**, in Greek legend, son of Amphitryon and Alcmene, and half-brother of Hercules, whose faithful companion he was.

**Iphicrates** (c. 420-348 B.C.), Athenian general, of humble birth, who made his name by developing the Greek infantry force known as peltasts.

**Iphigenia**, in Greek legend, the daughter of Agamemnon and Clytemnestra. When the Greek expedition was about to set sail against Troy from Aulis, the prophet Calchas advised Agamemnon to sacrifice Iphigenia to appease the goddess Artemis, which he did. See Euripides' two fine plays, *Iphigenia in Aulis* and *Iphigenia in Tauris*.

**Ipomoea**. A genus of the Convolvulaceae, including many cultivated species, mostly of a twining habit, and having auxiliary flowers of various colors. The most com-

mon *Ipomoeas* are the Morning-glories and the Moon-flowers, rapidly growing vines with large vivid blossoms. The Jalap and the Sweet Potato are tropical American *Ipomoeas*.

**Ipsambul**, **Ibsambul**, or **Abu-Simbel**, a place on the left bank of the Nile, the site of two magnificently sculptured rock temples erected in the face of a steep rock by Ramesses the Great.

**Ipswich**, municipal, parliamentary, and county borough, Suffolk, England. Noteworthy churches are St Mary-at-the-Quay, St Mary-at-the-Tower, St Margaret, St Mary Stoke, St Nicholas, St Peter's and St Stephen's. Industries include chemical manure works, breweries, and tanneries. The wet dock is one of the largest in Great Britain, p. 87,557.

**Ipswich**, town, Essex co., Massachusetts. Ipswich is an old town and of considerable historical interest, having been settled by John Winthrop in 1633. The Choate Bridge was the first arch bridge constructed in America, p. 6,348.

**Iquique**, seaport town, capital of the department of Tarapacá, Chile, on the Pacific coast. It has amalgamating works in connection with neighboring silver-mines, a foundry, and large exports of nitrate of soda, borax, and iodine. A battle was fought between the Peruvians and Chileans at Iquique in 1879, and in 1883 the town was ceded by Peru to Chile, p. 36,547.

**Iquitos**, a tribe of South American Indians who formerly occupied a wide domain about the rivers Tigre, Nanay, Napo, and other affluents of the Upper Amazon.

**Iraq**, new name of an Asiatic country, the ancient land known as Mesopotamia, lying between the Euphrates and Tigris rivers. During World War I the territory was liberated from Turkish rule by Anglo-Indian and British Dominion troops. By the Treaty of Lausanne, ratified Aug. 6, 1923, Turkey renounced sovereignty over Mesopotamia, and its future administration was entrusted under mandate to Great Britain. But already in November, 1920, a provisional Arab government had been set up by the British Commissioner, and in August, 1921, the Emir Faisal, third son of the late King Hussein ibn Ali of the Hejaz, was elected and crowned king of Iraq, he was succeeded by his son Emir Ghazi in 1933. Under a treaty concluded between Great Britain and Iraq in 1922, the British Government undertook to secure the admission of Iraq to the



Lower Paleozoic rocks, while the low grounds are co-extensive with the softer and comparatively undisturbed Upper Paleozoic strata. The Carboniferous system occupies about one-half of the area of Ireland, but the strata belong chiefly to the lower division—the Lower Carboniferous and the Carboniferous limestone, which latter is essentially the formation of the plains. Along the southern shores of Lough Neagh fresh-water clays occur, the fossils in which are of Pliocene age, so that this Irish lake is probably the oldest sheet of fresh water in the British Isles. Ireland, like the sister island, abounds with evidence of the Glacial period. Irish geologists recognize two boulder-clays separated by intervening stratified deposits of marine origin. Recent deposits are seen in raised beaches, alluvial terraces, and bogs. The Giants' Causeway is a fine example of the effect of basaltic lava contracting as it cooled. Since the separation of Ireland into two distinct political entities, under the Government of Ireland Act, 1920, as amended by the Irish Free State Act, 1922, all statistics relating to Northern Ireland and the Free State are compiled and published separately. The tendency in late years has been for Ireland to become less and less an agricultural country and more and more a pastoral one. The soil is generally fertile but in many places bad tillage and overcropping have reduced this fertility. Since the Small Holdings and Allotments Acts, 1908 to 1922, the number of small holdings has greatly increased. Dairying has improved greatly under the co-operative movement and bee-keeping is a growing industry. By far the bulk of Irish produce as well as manufactures are exported to Great Britain. The surrounding waters teem with fish, those of the deep sea are chiefly mackerel, hake, cod, haddock and sole. The rivers abound in salmon. Ireland had never been a prosperous manufacturing country, partly owing to the lack of coal and partly owing to England's restrictive measures. Northern Ireland is the seat of manufacturing, where linen weaving, flax spinning and shipbuilding are the important industries in the city of Belfast. Irish linen is the finest in the world. Ropes, twine, soap, tobacco, biscuits, hosiery, mineral waters and spirits, are among the other chief output. In independent Eire, the chief industries are meat and dairy products, boots and shoes, confectionery, biscuits, woollens, brewing and distilling, clothing, tobacco, sugar and jams. As already stated, most of the

trade is carried on with Ireland's neighbor, Great Britain, United States comes second, next follow, in rotation, Argentina, Germany, Canada, Belgium, Sweden, Holland, France, Australia, Latvia, Norway, Portugal, and Spain. All these represent foreign countries which are exporting to Ireland. The Ford Tractor Plant, opened at Cork in 1929, employed 4,000 Free Staters during the first year, its products were admitted to the United States duty free. Ireland is linked together by a good system of light railways and tramways. In Northern Ireland there are 754 miles of railroad and a system of waterways connected by canals, and about 13,000 m of excellent highways. Motor traffic is growing extensively throughout all of Eire, there are more than 4,000 m of bus routes, 3,028 m of railways. Steamships ply from Belfast, Cork, Kingstown and Dublin to Liverpool and Glasgow, American liners stop at Queenstown (Cobh). A census was taken of Ireland in 1926. When the decennial Census of Great Britain and British Dominions was taken in 1931, Ireland was not included. Independent Eire, besides the three Provinces already referred to, comprises also the Ulster counties of Cavan, Donegal and Monaghan. The total population in 1941 was 2,989,000. Northern Ireland comprises the cities of Belfast and Londonderry, and the counties of Antrim, Armagh, Down, Fermanagh, Londonderry and Tyrone. In 1938 the total population numbered 1,285,000. There has been no state-established church in Ireland since 1871. Elementary education is free under control of the Department of Education. The Irish language has been raised to an essential part in the curricula of all national schools. Nearly 9,000 teachers have qualified to teach that language. According to the latest figures, there were 5,555 elementary schools, 13,557 teachers, and 512,330 pupils. Secondary schools are mainly under private or clerical guidance.

Local authorities in all cities and most towns provide technical education, while higher education is provided by the University of Dublin, and the National University of Ireland. From the union of 1801 until the creation of Northern Ireland, and the Irish Free State in 1922, the government of Ireland had been amalgamated with that of Great Britain. The whole country was represented in the Imperial Parliament in London. The executive was vested in a lord-lieutenant, appointed by the crown. The actual ruler, how-





Pale The forces of the insurrection were supported by what was known as the 'Confederation of the Irish Catholics,' having at its head Rinuccini, an envoy from Rome. This made the wrath of the Long Parliament intense



Ireland

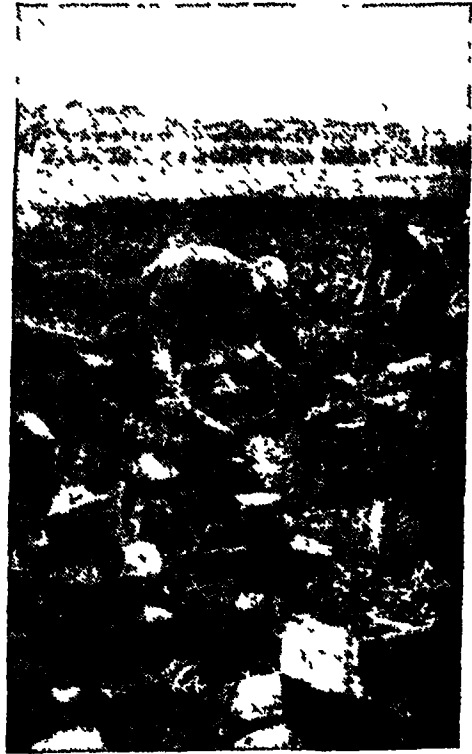
Street scene in Belfast

Charles began to temporize with the Catholic Irish chiefs. The Parliament, however, was baffled for a considerable time. After negotiations with the Catholic League on behalf of his master, Ormonde, the viceroy, and head of the royal army, gave up his trust to commissioners of the Long Parliament and left Ireland.

After the tragic death of Charles I, Ormonde returned to Ireland. The old Englishry joined him, and the Celts had dealings with him. His forces overran the country, and Dublin and Derry were the only towns that held out for the Parliament. But Ormonde failed in an attack on the Irish capital. Cromwell landed in Dublin in August, 1649, at the head of 10,000 warriors of the new model. He was the executioner of Puritan justice and of English vengeance. He subjugated Ireland in a few months as she had never been subjugated before. He resolved to colonize the island on a scale hith-

erto not thought of. The policy of Cromwell was to confiscate the greater part of the conquered land, and to occupy it with men of the Puritan faith and of English blood. This great scheme of colonization comparatively failed. In less than two generations not more than 3,000 or 4,000 new owners were to be found, but this settlement of the sword still lives in Irish tradition—'Cromwellian landlord' is still a name of reproach.

The island, however, made some advance in material welfare under the protector's rule, which enforced the law and maintained order, and a union with England was accomplished for the first time. At the restoration Charles II threw over hundreds of loyal Irish gentlemen who had fought for the crown, but the Cromwellian forfeitures were for the most part confirmed by what are still known as the Irish Acts of Settlement. Many of the ruined Irish owners went into exile and became the fore-



Ireland

Scene on a Peat Bog

runners of the celebrated Irish Brigade. But Ireland, on the whole, improved under the mild sway of Ormonde. James II trod in his unhappy father's footsteps, and aimed at making the Irish Roman Catholics instruments in



#### MAKING IRON AND STEEL

I-Tapping the blast furnace showing molten iron II-Drawing off steel from the open hearth furnace III Bessemer converters (right) being filled with iron and (left) blowing IV-Pouring Bessemer steel from the ladle into the ingot molds





pation of the Irish Catholics was, however, the principal Irish question in those years. Daniel O'Connell by degrees rallied all Catholic Ireland to his cause. Catholic emancipation was reluctantly conceded in 1829, after a struggle which seriously menaced the state.

The great reform era of 1832 brought with it partial reforms for Ireland. Symptoms of deep-seated evils, nevertheless, became manifest. O'Connell began to agitate for a repeal of the union. The agitation assumed gigantic proportions, but it never had a chance of success. Peel, who had become prime minister in 1841, brought in some Irish reforms. But a catastrophe at this juncture befell Ireland which for a long time engrossed the mind of the government. The potato, almost the only food of the indigent masses, failed partially in 1845 and fully in 1846, many counties were soon within the fell grasp of famine, whose immediate results were seen in the great exodus of the Irish race. A period of tranquility, prolonged for years, followed, Ireland made decided material progress. But the land system afterwards became worse on its economic side, and the diseased elements in the social life of Ireland were quickened into activity by the Fenian conspiracy, formed by leaders of the New Ireland across the Atlantic. It failed in an attempt to arouse rebellion in Ireland, but it alarmed and deeply stirred the mind of England and Scotland. Gladstone was called to power by the general election of 1868. He disestablished and disendowed the Anglican Church in Ireland, 1869, he carried a Land Act, 1870, he attempted to effect a great reform in Irish education of the higher kind. Meanwhile a movement was inaugurated by Isaac Butt and a body of discontented Protestants, who resented the fall of the Irish Anglican Church. The movement was not powerful, however, until Charles Stewart Parnell gradually became known among the Fenian leaders as the master spirit of a parliamentary following which had the independence of Ireland in view.

Ere long a movement had been set afoot in Ireland, the most formidable of that century, against British rule. Its author was Michael Davitt. The Irish Land League was founded in Co. Mayo, in the spring of 1879, and gathering strength, soon made its way into several other counties. Gladstone tried to weaken it by a reform of the Act of 1870, but his Compensation for Disturbance Bill was thrown out by the House of Lords. Agrarian crime having increased and a repressive measure having failed, he then carried through Parliament a measure

which transformed the whole Irish land system, giving the occupier of the soil the tenure known as the 'Three F's'—fair rent, fixity of tenure, and free sale.

But the reign of outrage and disorder did not cease, and Parnell and his lieutenants were put in prison. Suddenly Gladstone changed his policy. He entered into a compact with Parnell. The assassinations, however, of Lord Frederick Cavendish, and Mr. Burke brought this new prospect to an end. In 1886, when Gladstone became Prime Minister for the third time, he made a change of front, and declared for Home Rule. His first Home Rule Bill was defeated that year in the Commons, his second Home Rule Bill was passed in the Commons, but defeated in the Lords in 1892.

Under A. J. Balfour, 1887-1891, and his brother Gerald, 1895-1900, 15 secretaries, Ireland prospered, the Department of Agriculture and Technical Instruction was founded in 1899, and greatly promoted agriculture. In April, 1912, the third Home Rule Bill was introduced into Parliament. It met with violent opposition in those parts of Ulster where the population is mainly industrial and Protestant. After a series of public meetings a solemn covenant was signed at Belfast on Sept. 28, 1912, pledging the signatories 'to stand by one another in defending our cherished position of equal citizenship in the United Kingdom, and to defeat the present conspiracy to set up a Home Rule Parliament in Ireland.' After the Home Rule Bill had been twice rejected by the House of Lords, it was carried through the House of Commons for the third time on May 25, 1914, which enacted it into law. On Sept. 18, 1914, the bill received the royal assent. In the meantime, however, the outbreak of the Great War had put a new complexion on the matter, and the same date that saw the royal assent witnessed also the passage of a Suspensory Bill, deferring the application of Home Rule for a period of 12 months. This measure was supplemented by the publication on Sept. 14, 1915, of an Order in Council providing that 'if, at the expiration of 12 months, the present war is not ended no steps shall be taken to put the Government of Ireland Act, 1914, into operation.' The general discontent caused by this postponement of Home Rule was fanned by the appointment of Carson and other Ulster leaders to the British Coalition Cabinet. It culminated on Easter Monday, April 24, 1916, when active rebellion broke out in Dublin, led by a group of men prominent in the Sinn Féin, a radical organization founded in 1906, for 'the aid and support

of all movements originating from within Ireland. The rebels seized the Post Office and other public buildings, declared an Irish Republic with Patrick Pearse as president, and continued to defy the British forces until April 27 when Patrick Pearse and the other leaders surrendered. President Pearse and 13 of his associates were executed and a large number of others implicated were sentenced to imprisonment for long terms.

The general gravity of the rebellion was minimized by the British government, but the situation was considered sufficiently serious to reopen the question of Home Rule and an attempt was made under the leadership of Lloyd George to negotiate a settlement whereby the Act of 1914 should be brought into immediate operation. The proposed settlement though accepted provisionally by the Nationalist and Unionist leaders proved unacceptable to the body of both parties and on July 24, 1916, an announcement was made in the House of Commons, of the final failure of the attempted negotiations. The arrest in February, 1917, of 18 Irishmen under the Defence of the Realm Regulation led to a reopening of the Irish question in Parliament at that time. In reply to the Irish demand for the free institutions long promised to her, Lloyd George declared that the government was 'prepared to confer self-government on those parts of Ireland which unanimously demanded it but they were not prepared to coerce the new portion of Ireland.' John Redmond, the Irish Nationalist leader, responded with a solemn protest against the policy of the government and he and his fellow members of the Nationalist Party withdrew from the House of Commons. On May 16, 1917, Lloyd George brought forward a new plan of settlement of the Irish problem. This contemplated the immediate application of Home Rule to Ireland, with the exclusion of the six Ulster counties, the establishment of an Irish Council. As an alternative to this plan he proposed a 'convention of Irishmen of all parties for the purpose of providing a scheme of Irish self-government.' This alternative being accepted by the Nationalist and Unionist leaders, the convention assembled at Trinity College, Dublin, on July 25, 1917, and Sir Horace Plunkett was unanimously elected chairman.

The Sinn Féin element, which refused to participate in the Convention, was meanwhile showing evidence of increasing strength. The growing power of the party was evidenced by a convention held on Oct. 25, at Dublin, numbering 1,700 delegates representing 1,000 local

clubs with a membership of 100,000 or more. The Convention representing the other elements in Ireland continued to meet in secret session during the remainder of 1917 and the early part of 1918, and on April 6, 1918, submitted its report to the British Parliament. The plan of self-government therein set forth favored by a majority of the Convention provided for an Irish Parliament to consist of the King, an Irish Senate, and an Irish House of Commons, to have general power to make laws for the peace, order and good government of Ireland. Forty per cent of the membership in the Commons was guaranteed to the Unionists.

During the summer and fall of 1918 the situation became increasingly complex. In June the British government issued a report of a widespread conspiracy in Ireland backed by Germany, serious charges were brought against the Sinn Féin leaders. Returns in the General Election published Dec. 27, 1918, gave the Sinn Féin a massive majority. Seventy-three of their candidates were elected and the Nationalist representation dwindled to seven. In accordance with their policy for complete independence, the Sinn Féin representatives did not take their seats in Parliament but met in conference at Dublin, adopted a declaration of independence, and proclaimed the provisional government of the 'Irish Republic,' of which Michael Collins was made president. On Dec. 29, 1918, a new Home Rule Bill was outlined by Lloyd George in an address before the House of Commons. This proposal met with little favor. The Unionists characterized it as 'a dangerous weapon in the hands of the declared enemies of the Empire' and it was entirely out of harmony with the aspirations of the Sinn Féin for an independent Ireland. The latter organization was now in practical control of Irish nationalist politics. On Feb. 25, 1919, the Home Rule Bill was formally introduced into the House of Commons. Irish opposition to the government and the new bill was intense, and hostility to the British troops now being poured into Ireland and to the Royal Constabulary reached a high pitch. Violence continued unabated, while the situation was further complicated by the activity of the radical labor element, which encouraged a strike among railway workers as a protest against the transportation of British military stores.

The outstanding events of the late summer and early fall of 1919 were the passage in August of the Restoration of Order in Ireland Bill, the addition to the Royal Constabulary

of recruits from England and the death, after a hunger strike of 74 days, of Terence MacSwiney, Lord Mayor of Cork, who was arrested as a leading supporter of the Sinn Féin movement.

In the succeeding months disorder grew apace. Sinn Féin outrages and British reprisals resulted in greatly increased casualties and property destruction, and on Dec. 10 martial law was proclaimed by the British government. Negotiations looking to the establishment of a truce were undertaken late in 1920, but without result.

In the meantime the Government Home Rule Bill had passed its third reading in the House of Commons on Nov. 11 and had been sent to the Lords, who now for the first time in history gave their assent to a Home Rule Bill. But the campaign of violence continued, and warfare was carried into England, where incendiary fires attributed to Sinn Féin agencies were reported from Manchester, Lancashire, Liverpool, and London. On May 25 the Dublin Custom House, one of the most beautiful buildings in Ireland, was burned.

The opening of the Ulster Parliament, 1921, gave promise of a new era in Irish affairs. King George made a notable appeal that the granting of self-government might be a 'first step toward the end of strife' in Ireland, and Premier Lloyd George addressed an invitation to De Valera to attend a conference in London 'to explore to the utmost the possibility of a settlement of Irish affairs'. After preliminary conferences with the Ulster leaders, De Valera accepted the invitation, but the government proposals failed to meet the demands of the Sinn Féin leaders, who stood out for full independence and complete separation. At length, on Dec. 6, a treaty was concluded granting Ireland, henceforth to be known as the Irish Free State, 'the same constitutional status as the Dominion of Canada, the Commonwealth of Australia, the Dominion of New Zealand, and the Union of South Africa, with a parliament having powers to make laws for peace and order and good government in Ireland, and an executive responsibility to that parliament.'

The agreement made provision also for the appointment of a representative of the Crown in Ireland corresponding to the governor-general of Canada, and for an oath of fidelity to the Crown to be taken by members of the Irish parliament. Northern Ireland was exempt from the terms of the Act for one month from the date of ratification, during which time the provisions of the Act of 1920 re-

mained in force there. Further provision was made that if, before the expiration of the month, both houses of the Northern Parliament so petitioned, the powers of the Irish Free State government would no longer extend to Northern Ireland, which should continue to be governed under the 1920 act, if, after the expiration of a month, no such petition were presented, the Parliament and the Government of Northern Ireland should continue to exercise, as respects Northern Ireland, the powers conferred upon them by the Act of 1920, but the Parliament of the Irish Free State should assume the same powers in relation to matters, in respect of which the Northern Parliament had not the power to make laws, as it exercised in the rest of Ireland.

Special meetings of the British Parliament and of the Irish Dáil were called to ratify the treaty on Dec. 14. British ratification took place on Dec. 16, but the treaty was debated long and bitterly in Ireland. De Valera held that the Irish delegates had exceeded their authority and attacked the treaty. Arthur Griffith and Michael Collins led the forces for the treaty, and eventually secured a vote for ratification. Two days later De Valera resigned the presidency. Arthur Griffith was unanimously chosen to succeed him. The first meeting of the new Parliament formally ratified the treaty and created a provisional government. On Dec. 6, 1922, the Irish Free State actually commenced its being. Timothy M. Healy, an Irish Nationalist and a Roman Catholic, was appointed the first Governor-General. While thus the Irish Free State came legally into being with comparative ease and expedition, embittered controversies rent the country internally. Eamon de Valera had participated in the negotiations with the British government but he refused to accept the treaty or to carry it out. He represented a powerful body of republican extremists and their continued opposition seriously threatened the safety of the new state. Arthur Griffith, President of the Irish Free State, died suddenly and was succeeded by William T. Cosgrave. However, the government succeeded in maintaining itself in office in spite of all these difficulties. The Irish Free State was admitted to the League of Nations on Sept. 10, 1923. The year of 1924 brought the establishment of a commission to settle the boundary dispute between the Free State and Northern Ireland. The agreement was signed Dec. 3, 1925, and was ratified by the British, Free State and Northern Ireland Parliaments, but was repudiated by the Republicans. In

Aug., 1917 De Valera and his Irish Free Volunteers decided to accept the oath prescribed by the Constitution and to accept their seats in Parliament, announcing, however, that this did not consider the oath binding. Irish Free was organized by De Valera when he broke with the Sinn Féin. In the elections of July 9, 1917, he doubled his 22 members in the old Dail. The Government was no longer able to command a majority. Premier Co. was continued in office. De Valera was elected President in 1919 and instituted a program announced as one embracing a Christian social order with an economic council and a five year plan. It was directed toward making the country one of small holdings, small manufactures and small business. That part of the Constitution providing that members of Parliament were required to take the oath of allegiance to the Constitution and to the king was removed May 4, 1921. On October 1 following, the Government's bill was passed abolishing the right of Free State citizens to appeal to the Judiciary Committee of the Privy Council. The British Empire's highest court was replaced by the Dail December 19, 1921, declared that Irish Free State citizens were no longer British subjects.

A new Constitution was adopted in 1937. It changed the country's name to Eire and abolished the status of the king. In 1915 a pact was negotiated with the British Government which is expected to adjust the old differences and bring friendship between the countries. Seán T. O'Kelly became President of Eire in May, 1945. De Valera continued to head the Government as Prime Minister.

Although bombed by German airplanes in World War II, Eire was neutral and protested landing of U. S. troops in Ulster, 1941.

**Northern Ireland**—Though strong pressure had been exerted on the six counties of Northern Ireland to refuse separation from the rest of the country, a separate Parliament was opened in the state by the king, in 1921. The history of Northern Ireland during recent years, as the result of its close connection with Great Britain, is to a great extent closely identified with the history of that country, especially in view of the fact that the various vexing problems at issue between Northern Ireland and the independent Eire gradually were adjusted.

**Bibliography**—Consult Froude's *English in Ireland in the Eighteenth Century* (3 vols.), Bryce's *Two Centuries of Irish History*,

to see *See also History of Ancient Ireland*, Waller and Marlowe's *History of the Irish Rebellion of 1916* (1916), Phillips's *Rebellion in Ireland, 1862*, (1966) Warren's *Ireland's* (1955), Curtis's *The History of Ireland* (1955).

**Ireland, Church in** The church of Ireland according to tradition, was founded by St. Patrick in 432 and following years. At home the church was modeled on the archaic Celtic tribal system. It differed widely from the churches of feudal Christendom, and in deed, was regarded at Rome as almost schismatic. But though a church of the Roman type was established within the pale, the ancient Celtic Irish Church remained unchanged.

There were thus two churches in Ireland whose clergy were at continual feud. The church of the Pale extended its borders with the march of conquest in Ireland, it became Protestant in the reign of Elizabeth and was thenceforward known as the Established Church, but it was regarded as a symbol of foreign power, and had no hold on the masses of the Irish people. The old Irish Church, on the other hand, became, in the religious struggle of the sixteenth century, intensely popular, four-fifths of the Irish people rallied around it and its clergy became the leaders of what may be called Catholic Ireland.

During the civil wars in the 17th century the Established Church and its clergy were faithful allies of England. The Irish Catholic Church and its clergy her persecuting enemies. In the great reformatory era of 1642-49, the abuses of the Established Church were condemned and after a bloody conflict, known as the Irish War, its titles were commuted to a kind of hind title. Meanwhile a decisive change had been passing over the Irish Catholic Church. Its clergy were the master spirits of the movement which led to the emancipation of Catholic Ireland in 1801. The Established Church was disestablished and disendowed in 1869.

The Presbyterian Church of Ireland grew up with the settlements of the Scottish race in Ulster. It seems to have been established, in a certain sense, under the rule of Cromwell. After the Restoration, like the English non-conformist churches, it was an object of aversion to the statesmen of the Stuarts, but Charles II gave it a small bounty, which was considerably increased by William III. Persecuted wrongs made Presbyterian Ireland still rebellious in 1795-8, but since the union it has become attached to English rule.



**Ireland, National University of**, was established under the Irish Universities Act of 1908. It has eight faculties, embracing medicine, law, engineering, agriculture, philosophy, music, civil service, commerce, and the ancient Irish language.

**Ireland Island** See *Bermudas*

**Irene** (1) The Greek goddess of peace, called *Pax* by the Romans, according to Hesiod she was a daughter of Zeus and Themis. (2) Byzantine empress, was a native of Athens, whom Leo IV married in 769 AD. After Leo's death in 780, Irene returned and governed the empire for her infant son, when he grew up he attempted to throw off her control, and she had him murdered in 797, and then reigned alone. She continued to govern with power and prudence until 802, when the great treasurer Nicephorus rebelled, and banished Irene to Lesbos.

**Irgiz** See *Volga*

**Iridaceae**, an order of monocotyledonous plants, mostly inhabiting temperate and warm regions. It includes the crocuses, irises, ixiads, and gladioli.

**Iridescence**, the name given to the lustrous delicately tinted sheen observed on certain surfaces, such as mother-of-pearl and the wings of certain insects.

**Iridium**, Ir, 193, is a metallic element of the platinum family. It occurs in alluvial deposits along with platinum, and is separated from it and other similar metals present by somewhat complex chemical processes. Iridium is a very hard, white, brittle metal, of sp gr 22.4, and is extremely infusible. It is most resistant to oxidation or solution, and forms two, if not three, series of salts, of which iridic chloride,  $\text{IrCl}_3$ , is perhaps the most important. Iridium is employed for apparatus required to withstand very high temperature, alloyed with platinum, it is used for standard weights and measures.

**Iris**, in Greek mythology, was the daughter of Thaumias and Electra, and a sister of the Harpies. In Greek, the word *Iris*, as a common noun, means 'rainbow'.

**Iris**, a large genus of plants of the Iridaceae, characterized by reflexed sepals, which are longer than the petals, and petal-like stigmas, the leaves are usually long and sword-shaped, or grass-like. Upwards of 160 species are known, and on account of their conspicuous and handsome flowers a large number are cultivated in gardens under the name of *fleurs-de-lis*. They are easily grown in ordinary garden soil, well-drained, and stand abundant water and manure.

**Iris**, the seventh asteroid in order of discovery, found by Hind, Aug. 13, 1847.

**Irish Church** See *Ireland*

**Irish Land Legislation** The earlier phases of this subject are dealt with under *IRELAND*. In England, the landlord, from ancient usage, almost always made the permanent improvements in his farms, in Ireland, the permanent improvements were made by the tenant. This was one reason why agrarian discontent and crime continued to prevail, and were never fully put down. The tiller of the soil, deprived of the protection of the law, had recourse to a barbarous law of his own to maintain his hold on his farm. Sir Robert Peel, the British prime minister, in 1844 appointed a commission to investigate the whole subject of Irish landed relations, but the commission's report favored the landlord rather than the tenant. The terrible famine of 1845-47 caused the emigration of many thousands of peasants, but although this made the competition for land less intense, it left unaffected the equitable rights of tenants to compensation for improvements. Since 1860, twenty-six Land Acts have been passed.

In 1907 the Liberal Government brought out a Small Holdings and Allotments Act which came into operation Jan. 1, 1908. It authorized the county councils to acquire land compulsorily, and to lease it in small portions to desirable tenants. Taking advantage of his land hunger, this act provided that the tenant should pay for the land, and also pay annually a part of the capital cost of his holding, yet, when he had thus paid the entire cost, the land did not belong to him, but to the county council. See Montgomery's *History of Land Tenure in Ireland* (1889), Morris's *Land System of Ireland* (1888), Lefevre's *Agrarian Tenures* (1893).

**Irish Moss** See *Carrageen*

**Irish Parliament, The**, which existed for more than five centuries, from 1295 to 1801, did not begin to be representative of the Irish people until 1540-1, when Henry VIII summoned for the first time the Celtic tribal chiefs to a parliament in Dublin. The legislative body of limited jurisdiction which had ruled the country previous to that time was constituted almost entirely in the interest of the Anglo-Norman nobles and the English colony, but it became so oppressive that even the colonists preferred to be ruled from London rather than from Dublin, a choice which was carried into effect when Poyning's law

in 1494 placed the parliament under control of the king and privy council

During the reign of Charles I a minority in the assembly resolved to demand the repeal of Poyning's law, and the question as to whether the English parliament had a concurrent power to bind Ireland by its legislation became urgent and important. This was not settled until the Declaratory Act of George I expressly reaffirmed the supreme authority of the parliament in London. In the meantime all vestiges of legislative independence in Dublin had disappeared during the Civil War. Poyning's law and the Declaratory Act of George I were repealed in 1782 and in theory the legislature at Dublin acquired the right of making such laws for Ireland as it pleased, of appointing or dismissing an executive of its own, and even of raising an Irish army and navy. But the facts of the situation nullified the theory. In the new assembly, as in the old, men of British race and sympathies predominated, and the corruption so long practised reasserted its power by repressing all real legislative initiative. Certain useful laws, however, concerning local affairs were passed, and the country made considerable material and social progress.

England was then preparing for her gigantic struggle with revolutionary France and the power of Napoleon, and the suspicion, heightened in some instances into positive knowledge, that French assistance would be given toward the securing of Irish independence, caused a decided revulsion against the party whose policy seemed to lead that way. The old dissensions of race and faith revived, and the rebellion of 1798, one of the most mournful events in a dark history, led to a sanguinary civil war. William Pitt, the British prime minister, took advantage of the situation to effect a legislative union between England and Ireland. He had long contemplated the measure, which was carried in 1801, after a bitter and prolonged struggle in which bribery and corruption turned the scale against the forces opposed to them. Consult Williams' *The Irish Parliament*, O'Flanagan's *Annals and Traditions of the Irish Parliaments*, 1172-1800.

**Irish Sea**, a small but important sea lying between England and Ireland. It is connected with the Atlantic on the s by St George's Channel, and on the n by St Patrick's or North Channel. It is generally shallow, but in St Patrick's Channel it has a depth of 850 ft.

**Irish Terrier**, a medium size dog of the terrier class, noted for its pluck, good temper and affectionate disposition. It is used in Ireland for bolting foxes and for rabbit hunting. The Irish terrier is preferably yellowish red in color, with a hard, wiry coat, rather short and perfectly straight. The head is long and narrow, eyes dark hazel, and nose black. The legs are straight and strong, the tail set high and carried erect and the back rather short.



*Irish Terrier*

**Irish Wolfhound**, theoretically the oldest breed of dogs in Great Britain, is a recent revival of an almost extinct species. In color it may be gray, brindle, red, white, or black. The height is from 28 to 32 inches and the weight from 90 to 150 pounds. The coat is rough, hard, and wiry, the head long, ears small, and muzzle moderately pointed. The back is long, and legs are straight.

**Iritis**, an inflammation of the muscular curtain which surrounds the pupil of the eye, which may spread from adjacent structures, but may also result from a blow, or from some specific disease such as syphilis. There is usually some congestion of the conjunctiva, and of the sclerotic around the cornea. With the effusion of lymph from the inflamed iris there is a constant tendency to the formation of adhesions between the inner margin of the iris and the anterior capsule of the lens.

**Irkutsk**, government of East Siberia, extending from the Sayan Mountains to the valleys of the Upper Lena and the eastern tributaries of the Yenisei, area, 287,047 sq m. It is an elevated country, traversed by chains of mountains in the s, as the Kitoi and Tunkun, which trend northwards from the Sayan, while to the n ranges of moderate height accompany the Lena to the great plateau of North Siberia. The greater part of the area belongs to the agricultural zone of Siberia, but in the se and the s there

are forests The temperature is low Corn, tobacco, and hemp, are cultivated Cattle and horses are numerous, and minerals comprise gold, coal, iron, salt, and semi-precious stones Furs are obtained in abundance The native inhabitants are chiefly Buriats and Tunguses, p 715,000

**Irmín**, a god-hero of the old Germanic tribes, whose pillar, the Irmínul at Eresburg in Westphalia, was the palladium of the heathen Saxons in their wars with the Christianized Franks

**Irnerius**, Italian jurist who flourished during the early part of the 12th century He was born in Bologna, where about 1084 he founded a school of law According to ancient opinion, he was the first of the glossators, and was the author of an epitome of the *Novellæ* of Justinian, called the *Authentica*

**Iron**, one of the oldest, and most used of all metals, having been in use by man for some 5,000 years The earliest source was probably meteorites, composed chiefly of iron, but alloyed with small percentages of nickel, later it was obtained by crude reduction methods from some iron mineral, usually the oxide Iron of extremely high purity (99.9 per cent or better) has been a commercial product only since about 1910, and even yet is used only in a comparatively small degree Most of the ordinary commercial varieties of iron are alloys of the metal with various amounts, chief among these being carbon, manganese, silicon, sulphur and phosphorus, in some cases, other metals are also added to the combination, such as nickel, chromium, tungsten, and vanadium

Iron has an atomic weight of 55.9 and, when of high purity, an almost silver white color The pure metal melts at 1,535° C, and has a specific gravity of 7.86 It has a high degree of ductility and malleability, and a moderate tenacity The magnetic quality of the metal is exceptional, and is one of its most outstanding characteristics Iron is readily soluble in practically all of the common acids, forming 'ferrous' or 'ferric' compounds, corresponding to a valence of 2 or 3 respectively The metal is not attacked by dry air or oxygen, but in the presence of moisture, oxidation proceeds readily with either, forming the common iron rust, a hydrated oxide of the metal Oxidation or rusting is frequently prevented by covering the iron with a waterproof coating of paint or varnish, or by a coating of protective metal, besides the ordinary electroplating with a metal like nickel or copper, other processes

use zinc (galvanized or sherardized iron), tin (tin plate) tin and lead (terne plate), aluminum (calorized iron) and cadmium (Udylite process)

From an industrial standpoint, iron may be classed in the six following varieties (1) Pure Iron, (2) Pig Iron, (3) Cast Iron, (4) Wrought Iron, (5) Simple Steel, (6) Special or Alloy Steel The ores from which commercial iron is produced are almost exclusively oxides, carrying lime, clay, or siliceous materials as impurities, or 'gangue' The chief ores are magnetite, magnetic iron oxide, red hematite, iron sesquioxide, brown hematite or brown ore, hydrated sesquioxide of iron During recent years the production of iron ore in the United States has usually amounted to 50 to 60 million tons, a maximum of 75 million tons was reached during the war, in 1916 and 1917 Of the total amount about 95-96 per cent is usually red hematite, 1-2 per cent brown hematite, 3 per cent magnetite, and only 0.01 per cent carbonate In addition to these iron ores, other iron minerals are used for other purposes pyrite,  $\text{FeS}_2$ , is burned to make sulphuric acid, Franklinitite, a mixed oxide of zinc, manganese and iron, is used in the production of spiegeleisen, and alloy of manganese and iron, after the zinc has been removed and recovered, chromite,  $\text{FeO} \cdot \text{Cr}_2\text{O}_3$ , is used for its chromium content, and also as a refractory material in furnace construction Iron of exceptionally high purity may be made by electrodeposition, and is being produced on a limited commercial scale in two different types of process

**Ingot Iron**—Ingot iron is the name that has been given to a product of high purity produced by a modification of the basic open-hearth steel process (See STEEL)

**Pig Iron**—The majority of iron ores go directly to the blast furnace just as mined, some ores, however, are given some preliminary treatment to put them in better shape for reduction

The ore, either with or without preliminary treatment, is charged into the blast furnace, together with the requisite amount of fuel, usually coke but sometimes charcoal or anthracite, and sufficient limestone to combine with the siliceous gangue of the ore and form a fusible slag The preliminary heating, the calcining of the limestone to form lime, and most of the reduction of the iron ore to spongy, solid metallic iron, take place in the shaft, the resulting spongy iron, with its gangue and the lime from the decomposed

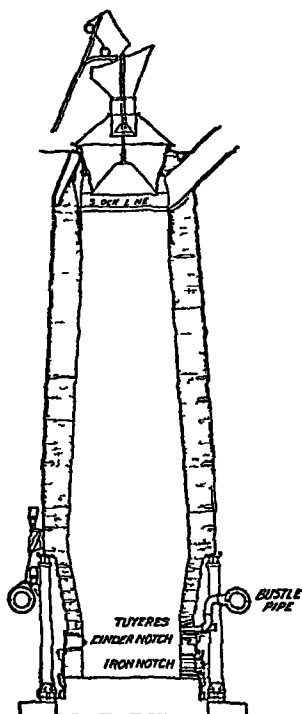
limestone, then pass to the second, an inverted truncated cone known as the 'bosh', here the remnants of unreduced ore are converted to iron, and gangue and the lime unite to form a fusible slag, and the iron melts. The liquid iron and slag then trickle down over the solid white-hot coke which fills the bosh and collect in the third section, a straight cylindrical section known as the 'hearth' or

necessary heat to carry on the fusion operations in the bosh and the heating operations in the shaft, also in the shaft the hot carbon monoxide serves as a reducing agent to abstract the oxygen from the iron oxides of the charge, converting them to spongy metallic iron, and in turn being converted to carbon dioxide.

The iron as melted in the upper part of the bosh is quite high in purity, but as it passes through the higher temperature in the lower portion of the bosh, in contact with the slag and the hot coke, it takes up carbon from the coke and other impurities from the slag so that as finally removed from the furnace it contains considerable amounts of carbon, manganese, silicon, sulphur and phosphorus. When the top holes are opened and the accumulated slag and iron removed in separate ladles, the slag goes to the waste pile, while the iron is cast, sometimes in sand moulds, but now more frequently in metal moulds in an automatic casting machine, into ingots weighing about 100 lbs each, known as 'pigs,' from which the product has come to be known as pig iron. In case the iron is to be used in the same plant for direct conversion into steel, the ladle of liquid pig iron, instead of going to the casting machine, will be poured into a heated storage vessel known as a 'mover,' from which it is drawn as needed. The average production of the modern blast furnace is 500 to 600 long tons of pig iron per day.

The world's production of pig iron during recent years has generally been between 50 and 60 million tons per year, with years of depression falling considerably below this total, and good years going to better than 70 million tons. Of this total the production of the United States has usually been from 30 to 40 million tons. Other important producers are, in order of importance, Germany, France and Great Britain.

**Cast Iron**—Cast iron may be made by the direct casting of the pig iron as it comes from the blast furnace, but this method is little used except for the production of rough castings used around the blast furnace plant itself. Most cast iron is the result of the remelting in a cupola or reverberatory furnace of a pig iron of such composition as will give an iron of the desired physical properties, since it is difficult to obtain a pig iron of exactly the desired composition for the large variety of requirements to be fulfilled, the charge for remelting is usually made up of a mixture of two or more irons of differ-



Section of Modern Blast  
Furnace

(From Camp's Making, Shaping  
and Treating of Steel, Carnegie  
Steel Co.)

'crucible' Since the liquid iron is much heavier than the slag, it collects in the bottom, and the slag floats on top. After several hours' operation the hearth will be practically full of iron and slag, and ordinarily they are removed four times a day through tap holes provided in the side of the hearth. The hot carbon burns with the oxygen of the air blast to form carbon monoxide and a high temperature is generated. The pressure of the blast carries this hot mixture of carbon monoxide and nitrogen up through the openings of the charge to which it imparts the

**Data Engineer**

ent composition, in such proportions as to approximate the desired composition

**Wrought Iron**—Wrought iron is still extensively made, using a slight modification of the puddling process devised by Henry Cort in 1784. The operation is fundamentally a differential oxidation process, and differs from the open-hearth steel process chiefly in that the temperature maintained in the furnace is so low that the final product is a pasty solid instead of a liquid. The process is carried out in a reverberatory furnace directly fired with coal, lined or 'fettled' with lumps of iron ore, and with a capacity usually of 500 to 1,000 pounds. The raw material is a medium grade of pig iron, and the oxidizing action of the flame is supplemented by the addition of magnetic iron oxide, usually in the form of 'mill scale' or 'roll scale'. The oxidizing action of the flame, during the melting down of the charge, serves to oxidize part of the silicon and manganese of the pig iron, after the charge is completely melted, roll scale is added to form a highly oxidizing slag, and assist the action of the flame. This completes the oxidation of the silicon and manganese, the oxides formed combining with some of the furnace lining and the roll scale to form more slag. After the silicon and manganese the phosphorous is attacked, and finally the carbon. During the entire operation the charge must be constantly stirred or 'puddled' to bring fresh material into contact with the oxidizing slag. As the impurities in the iron are eliminated the melting point of the metal increases, and finally goes above the temperature maintained in the furnace, and as the final stages of the purification are carried on, the metal solidifies to a pasty mass which, however, due to the constant stirring and the liberation of bubbles of carbon monoxide gas from the oxidation of the carbon, is quite spongy and porous, and these pores are more or less filled with the liquid slag. When purified to the desired degree the pasty mass is rolled up into several balls, which are removed from the furnace and subjected to successive squeezing and rolling in order to consolidate it to a solid mass and to eliminate as much as possible of the slag.

The first rolling results in a rough bar about one by 3 inches, known as 'muck bar', still further to eliminate slag and refine the structure of the iron, the muck bar is cut into short lengths, tied into bundles, reheated and again rolled, giving 'merchant bar' (See also ROLLING MILLS.) See also STEEL.

Consult Harbord and Hall's *The Metallurgy of Steel* (1916), Johnson's *The Principles, Operation and Products of the Blast Furnace* (1918), Skelton's *Economics of Iron and Steel* (1924), Camp and Francis' *The Making, Shaping and Treatment of Steel* (1925). For Canadian iron see CANADA, *Mining, American Foundrymen's Association, Symposium on Iron Melting* (1943).

**Iron Age**, a term in use among modern archaeologists to denote that stage of culture which is marked by a knowledge of the art of iron-working, and consequently by the general employment of iron implements. The knowledge of the art of working in iron was known to the ancient Babylonians and Egyptians, the latter of whom gave to iron the name of *ba-en-pet* ('the celestial metal'). Curiously enough, iron was at the same time regarded by a certain school in ancient Egypt as conveying a moral taint to those who used it. It is probable that the Jews derived their knowledge of iron from the Egyptians. A passage in Ezekiel seems to indicate, however, that the metal was chiefly imported from Tarshish, a region variously localized in Spain, Asia Minor, and Arabia. There are strong indications that Asia was in its 'iron age' long before Europe, and Indian steel was greatly prized among the Greeks.

Dr Schröder points out that the Teutons obtained their name for iron from the Celts, and this, he suggests, connotes their first acquaintance with the metal itself. Iron was undoubtedly manufactured by the Celts at an early date. 'The continental Celts are known to have used iron broadswords at the battle of the Arno in the 4th century before Christ,' observes Mr Elton, 'and iron was certainly worked in Sussex by the Britons of Julius Caesar's time.'

**Ironbark Tree**, a name given to certain species of Eucalyptus, known as red, white and silver-leaved ironbark trees, some of which are celebrated for the hard and durable nature of their timber, which is particularly valuable for shipbuilding.

**Iron Cross**, a Prussian military order, originally instituted by Frederick William III in 1813, as a reward for eminent service in war, especially in the national struggle against Napoleon. It is a Maltese cross of iron edged with silver, suspended from the neck or from a buttonhole.

**Iron-founding**, the art of making a facsimile of a pattern by impressing it in sand or other material and running molten metal into the impression. The pattern is usually

made of wood in one or more pieces, and is a little larger than the required copy, since the metal shrinks in cooling. A mixture of two or more kinds of pig iron is used, so as to produce a casting suited to the required purpose, as the different varieties of cast iron vary much in elasticity and strength, and in suitability for machining, etc. The pig iron is usually melted in a cupola furnace, which is of the blast-furnace type, and has a circular hearth, with a nearly cylindrical shaft of firebrick cased with iron.



Decoration of the Iron Cross

**Iron Mask, Man in the** On Nov 19, 1703, a prisoner who always wore a mask of black velvet, died in the Bastille at Paris, on November 20 he was buried. He has been held to be one of eleven persons, the chief of whom was a natural son of Louis XIV, the duke of Vermandois, an elder brother of Louis XIV, an offspring of Queen Anne and Cardinal Mazarin, Count Matthioli, Eustache Danger, a valet, and an unknown head of a conspiracy to assassinate Louis XIV. Jung fastens the mask to a M<sup>re</sup> Marchiel, an adventurer sent to the Bastille by Louvois.

**Ironsides**, the nickname given to Cromwell's famous regiment, had been originally applied to Cromwell himself.

**Ironsides, Old** See Constitution, U S S

**Ironton**, city, Ohio. It is the center of a district rich in iron ore and bituminous coal, as well as pottery and fire clay, p 15,851.

**Ironwood**, an American deciduous tree (*Ostrya virginica*), belonging to the order Betulaceae, and noted for its tough, hard wood. It is sometimes known as the hop-hornbeam.

**Irony**, in its original sense, signified the method adopted by Socrates and the Greek sophists of feigning ignorance of a subject in

order to induce their antagonist to state his views, and then leading him on from one position to another until the inherent absurdity of his argument was seen. More commonly the term denotes that figure of speech in which a speaker in mockery adopts a view opposed to his own in order to emphasize its folly. The great modern exponent of Socratic irony is Pascal, who in his *Provincial Letters* adopts, as it were, the standpoint of the Jesuitical casuists, and by developing and collating their arguments exposes their tendency. In English literature Defoe and Swift have carried the method to an even greater length.

**Iroquois**, one of the great divisions of the N American Indians. Their original home appears to have been the upper St Lawrence R, along both banks of which they gradually moved southwestward into the heart of the Algonquin domain, occupying a great part of Ontario, Canada, the whole of New York, most of Pennsylvania, and considerable tracts in Ohio and Michigan. Politically the Iroquois enjoyed more coherence than any other North American people, having at an early period established the famous league of the 'Five Nations'—Mohawks, Oneidas, Onondagas, Senecas, and Cayugas, and became the 'Six Nations' when they were joined by the Tuscaroras from North Carolina about 1720. The league, because of its admirable political organization, was able not only to hold its ground, but also to extend its power and influence over the Mohicans, Nanticokes, Shawnees, Mississaugies, and some other Algonquin peoples. During the border warfare the Iroquois usually sided with the English, and the Northern Algonquins with the French. In the Revolution the league declared itself neutral but the various tribes were generally favorable to the British.

After the Revolution, the Mohawk and Cayuga, with other Iroquoian tribes, were settled by the Canadian government on a reservation on Grand River, Ontario. In the United States they are all on reservations in New York, except a part of the Oneida, who are in Wisconsin, and a tribe of Seneca in Oklahoma.

**Irradiation**, an optical phenomenon in virtue of which bright, luminous surfaces, lines, or points appear to be larger than they really are. It is really a physiological effect, and depends upon the manner in which the eye responds to the stimulus producing vision.

**Irredenta**, an Italian society aiming at the liberation from foreign dominion of all

territory outside the political boundaries of Italy, in which the inhabitants speak Italian or are of Italian stock, especially the southern districts of Tyrol (Trentino) and Trieste. It was particularly active immediately after 1878, but fell under the suspicion of cherishing antimonarchical and revolutionary aims. It again became active during the Great War, displaying special interest in the disposition of Fiume, the Trentino, the Dalmatian coast, and Trieste.

**Irregulars**, in military usage, are bodies of men who serve intermittently as soldiers, but who retain in the intervals of such service their civil character and more or less complete independence of military authority. They may vary in character from a well-regulated militia to a rude guerilla force.

**Irrigation**, the artificial application of water to land, for the purpose of furthering crop production. On account of the nature of the works required for the control of water, it includes a special branch of engineering, which involves a knowledge of the available water supply, its conservation and application to the land, the characteristics and needs of different soils, and the requirements of the particular crops to be produced.

Irrigation, probably one of the oldest occupations of civilized man, antedates recorded history. Various countries in Asia, Africa, Europe, and America have remains of irrigation works of unknown antiquity, and the hieroglyphic records of the Pharaohs of the twelfth dynasty give evidence of its practice in Egypt as early as 2500 B. C. Historical records of irrigation in India date back as far as 300 B. C., and it is estimated that that country has now over 40,700,000 acres under irrigation. In no other country is irrigation practiced on so large a scale and the activities of the British government are being constantly extended.

By far the most important method of irrigation, and the one most widely used, is by means of open canals and laterals. The use of cement pipes in place of open canals in order to prevent losses due to percolation and evaporation, is, however, constantly increasing. The flooding system is recommended for open sandy soils, since they are best adapted to the safe use of large irrigating heads.

Furrow irrigation is especially suited to the watering of crops growing in rows. It consists in turning the water into furrows which run across the field in the direction of suitable slope. Furrow irrigation is better adapted to undulating fields and steep slopes

than is flooding, since it encourages deep rooting and is more economical of water. Akin to the furrow system is that known as the corrugation method, applicable to crops such as grain and alfalfa. As far back as the time of the Spanish conquests in America, extensive and well-built irrigation systems existed. Traces of such works have been found in Southern Arizona, New Mexico, Colorado, and California. Modern irrigation began about the middle of the 18th century with the watering of the gardens in the hills and deserts of California by the adventurous missionaries from Mexico. One hundred years later the Mormons in Utah, separated by a thousand miles of untrodden desert from all cultivated land, found in irrigation their only escape from starvation. In a sense, therefore, Brigham Young may be called the father of irrigation in the United States.

In 1902 Congress passed the Reclamation Act which set aside the proceeds of the sales of public lands for the construction of irrigation works in seventeen arid States. The work done as a result of this Reclamation Act is under the direction of the Reclamation Service which is an independent agency under the Secretary of the Interior.

The area irrigated in 1932 with water from Governmental works was 2,769,605 acres.

Work on the Boulder Dam project began July, 1930. It was completed March 1, 1936. A feature of this project is a canal to convey water from the Colorado River to Imperial Valley to assist in the irrigation of that section. In February, 1935, the gate of Boulder Dam was closed, diverting the waters of the Colorado River into the world's largest artificial lake requiring three years to fill. The dam is 730 feet high and 650 feet wide at the base. The purpose of this dam is fourfold: flood control, navigation, production of electric power and irrigation. It is expected that this project will convert into farming land two million acres in the desert regions of Arizona, California and Nevada. It cost \$76,500,000. The United States Government had a number of other great irrigation and water power projects under construction in 1941, including the Shasta Dam, in California, at a cost of some \$70,000,000, and the Marshall Ford Dam, in Texas, costing about \$25,500,000. The Grand Coulee Dam was completed in 1941 at a cost of \$125,000,000.

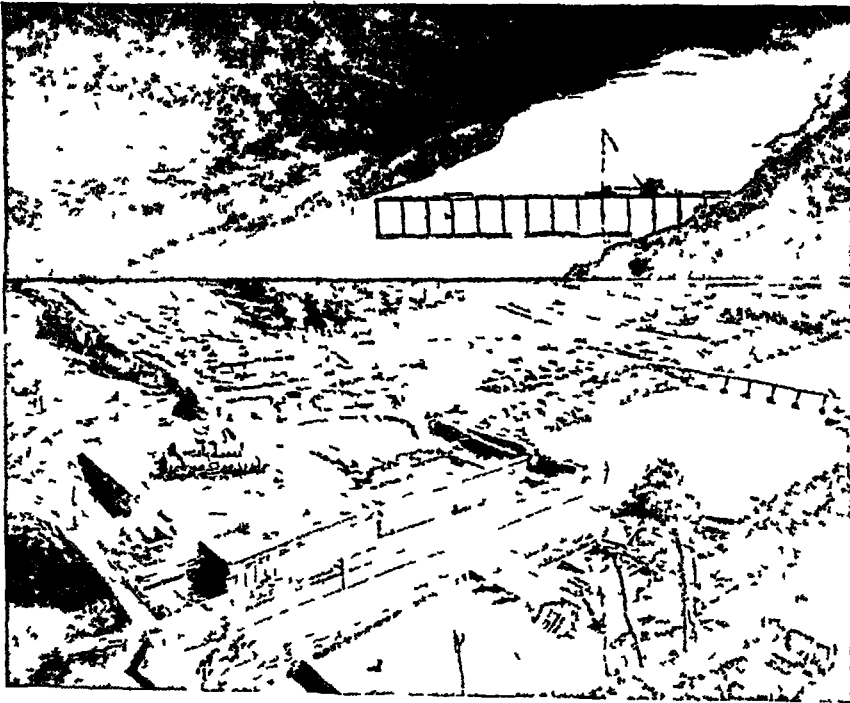
In other parts of the world similar undertakings have been completed or are in the process of completion. Russia constructed a dam in the Dnieper River at a cost of \$110,-

000,000, and is constructing a similar dam in the Volga River

Reclamation of land by irrigation has also been undertaken in India, Ceylon, China, Iraq, France, Spain and Italy. See RECLAMATION, UNITED STATES, *Irrigation, DAMS, TENNESSEE RIVER*

The U S Government's published reports on irrigation are contained principally in the following series *Water Supply and Irrigation Papers* of the U S Geological Survey, *Bulletins* of the U S Department of Agriculture,

**Irvine, William** (1741-1804), Irish-American soldier, was born near Enniskillen, Ireland. He was educated at the University of Dublin, was a surgeon on a British man-of-war during the Seven Years' War, and in 1763 emigrated to America and settled at Carlisle, Pa. In the controversies between the colonists and the British ministry he allied himself with the 'Whigs' or 'Patriots,' and during the Revolutionary War served as colonel of Pennsylvania troops in the Canadian expedition of 1776. He was a member of the Conti-



*Irrigation Plants*

Upper, Colorado River, Lower, Tennessee River

*Annual Reports* of U S Reclamation Service, *The Reclamation Record*, Fletcher's *Water Magic* (1945)

**Irtysh River**, a navigable tributary of the Siberian river Ob, or Obi, rising in the Altai Mountains, in China, and flowing northwest through Lake Zaisan, past Tobolsk, to join the main stream after a course of about 2,520 m. The Irtysh is navigable for nearly 2,200 m of its course

**Irulas**, a tribe inhabiting the forests of Southern India, on the Nilgiri Hills, and in Arcot and other places. They number some 86,000

national Congress (1786-8), of the Pennsylvania Convention which ratified the Federal Constitution, and of the national House of Representatives (1793)

**Irving, Edward** (1792-1834), Scottish clergyman, and one of the originators of the Catholic Apostolic Church, was born in Annan, Dumfriesshire. He was educated at the University of Edinburgh and after some years spent in teaching and studying was assistant to Dr Chalmers at St John's, Glasgow, from 1819 to 1822, when he was called to Cross Street Chapel, London. Here his fiery eloquence attracted great crowds, the sensa-



tion being heightened by his book of discourses, *For the Oracles of God*, published in 1823, and he soon occupied the pulpit of a large and fashionable church in Regent Street. His popularity waned after he gave way to mysticism and extravagance of thought, and believed himself a prophet. Deposed from the ministry (1832) on the charge of heresy, he formed, with Henry Drummond, the banker, a community of Christians, who later became the Catholic Apostolic Church, and are frequently designated Irvingites. The sect does not differ in its dogmas from the church catholic, but it recognizes orders of apostles, prophets, evangelists, pastors or 'angels,' etc., and has a ritualistic service and elaborate liturgy. Its communicants number about 50,000, mostly in Britain.

**Irving, Sir Henry** (1838-1905), English actor, whose real name was John Henry Brodribb, was born in Kenton-Mandevile, Somersetshire. He made his debut at Sunderland in 1856, as Gaston in *Richieu*, and then went to Edinburgh, where he acted in the stock company managed by Robert H. Wyndham. In 1866 he secured an engagement at the St. James' Theatre, London. One of the first plays produced was *Hunted Down*, and, as Rawdon Scudamore, Irving arrested the attention of the critics. As Digby Grant in *The Two Roses* (1870), he earned increased distinction, but his real fame dates from his engagement at the Lyceum in 1871. Thenceforward for upwards of 30 years Irving was intimately associated with this celebrated house. It was his performance as Mathias in *The Bells* which first established him securely in the estimation of the London playgoing public. His appearance as Hamlet stamped him as a Shakespearean actor of rare distinction, although his reading of this part and subsequently that of Macbeth gave rise to a lively controversy.

In 1878 Irving became lessee of the Lyceum, associating with him Ellen Terry, who had first appeared with him at the Queen's Theatre in Longacre, in *The Taming of the Shrew* (Dec. 26, 1867). Among the plays produced by them at the Lyceum, Shakespearean productions bulked most largely, being performed upon a scale of magnificence and with an attention to art in every detail which were previously unknown on the British stage. In 1895 Irving was knighted by Queen Victoria. On Saturday, July 19, 1902, he gave his last performance at the Lyceum, the *Merchant of Venice* be-

ing the play selected. Irving first visited the United States in 1883, with Miss Terry and his Lyceum company, making his debut in New York as Mathias. He was cordially received, and made subsequent tours in 1884-85, in 1887-88 (when he played Mephistopheles in *Faust*), in 1893, and several times thereafter. Consult Archer's *Henry Irving*, Calvert's *Sir Henry Irving and Miss Ellen Terry*, and Brereton's *Life of Henry Irving*.

**Irving, Washington** (1783-1859), American author, was born in New York City on April 3, 1783. On the paternal side he was of Scottish descent, his father being a native of the Orkney Islands, who had emigrated to New York in 1763 and there established himself in business. His early education was obtained at small schools. Two of his brothers had attended Columbia College, but Washington seems not to have been considered studious enough to warrant



Washington Irving

a college course in his case. At any rate he entered a law office at the age of 16, but devoted more time to the reading of general literature and to excursions up and along the Hudson than to his textbooks. His health led his brother to send him to Europe and he visited France, Italy, Sicily, and England, and met in London many notable people of the day, returning to New York (1806) with a rich store of observation. In 1806 he began work on the

*Salmagundi* (1806), a semi-monthly periodical, modelled upon the *Spectator* and other papers of the old essayists. It ran its amusing course for 20 numbers. Not long after this, he began work on the *History of New York* by Diedrick Knickerbocker (1809), whose quaint humor and felicitous style at once rendered him famous on both sides of the Atlantic, placing him in the position of the first American man of letters to gain an international reputation.

In 1819-20 he wrote *The Sketch Book*, *Bracebridge Hall* (1822), a delightful study of old English manners, and *Tales of a Traveller* (1824). During 1826-9 he was in Spain, in the United States diplomatic service. In 1828 appeared his *Life and Voyages of Columbus*. A year later he was sent as secretary of legation to Great Britain, whence he returned to America in 1832. Shortly thereafter he made an extensive tour in the Western States and territories, a record of which was subsequently given in his *Tour on the Prairies* (1835). He was United States minister to Spain from 1842 to 1846, and continued his study of Arabian history there, publishing, in 1849-50, *Mahomet and His Successors*. He died on Nov. 28, 1859, and was buried in the Sleepy Hollow cemetery. He had never married. Irving's other works, not mentioned above, are *Conquest of Granada* (1829), *Voyages of the Companions of Columbus* (1831), *The Alhambra* (1832), *Legends of the Conquest of Spain* (1835), *Recollections of Abbotsford and Newstead Abbey* (1835), *Astoria* (1836), *Adventures of Captain Bonneville* (1837), *Wolfert's Roost* (1855), *Life of George Washington* (1855-9), and biographies of Goldsmith (1849) and Margaret Miller Davidson (1841). Consult P. M. Irving's *Life and Letters*.

Irwin, Wallace (1876- ), American author, was born in Oneida, N. Y., and educated in Denver and at Leland Stanford University. He became a special writer for various California papers, and from 1906 to 1907 was on the staff of *Collier's Weekly*. His writing is both serious and humorous. Among his works are *Love Sonnets of a Hoodlum* (1902), *The Rubaiyat of Omar Khayyam Jr.* (1902), *Nautical Lays of a Landsman* (1904), *Chinatown Ballads* (1905), *Letters of a Japanese Schoolboy* (1909), *The Blooming Angel* (1919), *Seed of the Sun* (1921), *Lew Tyler's Wives* (1923).

Irwin, William Henry (Will) (1873-

), American writer, was born in Oneida, N. Y., and was graduated from Leland Stanford University in 1899. He was reporter and special writer for California and New York papers, and from 1906 to 1907 was managing editor of *McClure's Magazine*. In 1914 and 1915 he was war correspondent for several American publications and in 1916-18 for the *Saturday Evening Post*. His publications include *The Confessions of a Con Man* (1909), *The House of Mystery* (1910), *Men, Women and War* (1915), *The Next War* (1921).

Isaac ('he laughs'), the son of Abraham and Sarah, born in their old age. He married Rebekah, his cousin, who bore him twin sons, Esau and Jacob.

Isabela, province, Philippine Islands, in the northern part of the island of Luzon, on the e coast, with an area of 4,052 sq m. It is mountainous and forest-clad. The Sierra Madre range is near the coast and the drainage is inland to the Grand de Cagayan River, which rises in the extreme southwestern part and traverses the length of this province and the province of Cagayan to the n. Rice, sugar cane, chocolate, coffee, corn and tobacco are grown. The Rio Grande, which is paralleled by a wagon road from Manila, is an important highway for the transportation of products. The wild inhabitants of the interior represent a great number of different tribes. Iligan, the capital, with a population of 23,279 is 168 m n.w. of Manila, p. 112,960.

Isabella (1295-1358), daughter of Philip the Fair of France, married Edward II of England at Boulogne in 1308. She and the king did not agree, and she often sided with his enemies. She was probably privy to his murder, and she and her paramour, Mortimer, ruled England for some time after the accession of her son, Edward III.

Isabella II. See Spain.

Isabella of Castile (Isabella I). See Ferdinand V.

Isaiah, the greatest of the Hebrew prophets, was born about 760 B.C., and died some time subsequent to 701 B.C. He was the son of one Amoz, was called to his prophetic task in the year of King Uzziah's death (B.C. 740 or 736), and continued to labor during the reigns of Jotham, Ahaz, and Hezekiah. His career is bound up with the fortunes of Jerusalem, both in a religious regard and in its relations to foreign powers, especially Egypt and Assyria. The *Book of Isaiah* falls into two parts,

separated by the four historical chapters, 36-39, and differing greatly in style and standpoint. The first part, Ch 1-35, contains the unquestioned prophecies of Isaiah. Ch 40-66 seems to be, on the whole, a prophecy of the process and consummation of the deliverance of the exiled Judah from the grasp of Babylon (not Assyria), which deliverance is apparently regarded as imminent, or indeed as in part accomplished.

Until the last quarter of the 18th century AD these 66 chapters were regarded as an indivisible whole, and as the work of one man. After much controversy, lasting almost until the present day, one may now venture to say that the theory of at least two authors has won the assent of almost every scholar of note. What remains (on any theory) of the real Isaiah is sufficient to show that he was one of the greatest—perhaps the very greatest—of the Hebrew theologians, statesmen, and religious writers.

**Ischia** (anc *Aenaria*), volcanic isl of Italy, on w side of Bay of Naples, 20 m in circumference. Its natural beauties and its hot springs attract numbers of visitors. Wine and fruit are grown, fishing and straw plaiting are carried on. The island was shaken by earthquakes in 474 BC, 92 BC, 1302, and in 1883 AD, p 27,600.

**Isehn, Charles Oliver** (1858-1932), American banker and yachtsman, born, of Swiss-Irish descent, in New York. In 1895 he headed the syndicate which won the America's cup, with the cutter *Defender*, against Lord Dunraven's *Valkyrie III*. Again, in October, 1899, Mr Isehn, with J Pierpont Morgan, successfully defended the cup, with *Columbia*, against Sir Thomas Lipton's *Shamrock I*, and he was a part owner of the *Columbia* when she won the 12th successive contest for the cup, against Sir T Lipton's *Shamrock II*, in September and October 1901. He was also part owner of the *Rehance*, which won the cup contests in August and September, 1903, against Sir T Lipton's *Shamrock III*.

**Iseo, Lago d'**, lake of Italy, 15 m from Bergamo in a valley of the Alps, midway between Lago di Garda and Lago di Como. It is 15 m long, and from 1 to 3 m across. Noted for beautiful scenery.

**Isère** (1) Department (area, 3,180 sq m) of S E France, between the Rhone and Savoy. S and e of the Isère it is very mountainous, while the n and w consist of plateaus broken up by valleys. The highest point, the Aiguille du Midi (13,075 ft), rises

on the se frontier. The slopes are partly forest-clad and partly grassy. Coal and iron ore are mined, and marble and slates are quarried. The Grand Chartreuse liqueurs were made in the now deserted monastery 14 m n of Grenoble, p 568-933. (2) River in S E France, rises on the Italian frontier, and winds w and sw 150 m, through the departments Savoie, Isère, and Drome, to join the Rhone on its l bk a few miles n of Valence. Length, 180 m, of which 100 m are navigable, though with difficulty.

**Isergebirge**, short mountain range (2,000-3,000 ft) of Germany, the w continuation of the Riesengebirge, divides Prussian Silesia from what was formerly called Bohemia.

**Iseult** See **Tristan**

**Ishmael** ('God hears'), the son of Abraham and Hagar, Sarah's handmaiden. Owing to Sarah's jealousy after the birth of Isaac, Ishmael, when about 15 years old, and his mother were expelled from Abraham's home, but the son took up his residence in S Canaan, where he became a noted archer. He is the eponymous ancestor of the Ishmaelites, and it is through him that the Mohammedans trace their descent from Abraham, holding that his father and he constructed the Ka'aba at Mecca, where his tomb is pointed out.

**Ishpeming**, city, Marquette co, Mich, 15 m wsw of the port of Marquette on L Superior. It is an important iron-mining center being situated in the heart of the Marquette range. Gold and marble are also found in the vicinity. It has several large shops for the repair of mining machinery and manufactures dynamite, lumber, etc., p 9,491.

**Isinglass**, a variety of gelatine prepared by cutting the dried swimming-bladder of various fish into very fine shavings. It is employed in cookery, but chiefly, on account of its peculiar structure, for clarifying wine and beer.

**Isis**, ancient Egyptian deity, wife of Osiris, and mother of Horus. She was originally the goddess of the earth, afterwards of the moon. The Greeks identified her with both Demeter and Io. Her worship was introduced into Rome towards the end of the republic, and became very popular, though, because of its licentious orgies, it was more than once checked by the government.

**Isis, river** See **Thames**

**Islam** (Ar, 'resignation,' submission; se

to God), the name used by Mohammedans for their religion. See MOHAMMEDANISM.

**Island** is a mass of land entirely surrounded by water. The largest islands are the Old World, the New World, Australia, and probably Antarctic. These may be termed continent islands. Greenland, the next in area, is less than one-third the area of Australia and, along with all islands which possess the same complex structure of the continent islands, may be called a continental or relic island. Other islands are composed of volcanic or coralliferous rocks, or both. They are formed by the gradual rising above the waves of either material from the interior of the earth, or by the agglomeration, by currents, waves, and winds, of the skeletons of corals and other marine organisms secreting skeletons, mainly calciferous. (See CORAL.) The term continental island has been used to distinguish islands rising above the continental shelf from oceanic islands. This would make New Zealand an oceanic island. Oceanic islands, in the biological sense, are those isolated from the influences of continental life, and possessing peculiar flora and fauna due to this isolation. The proportion of endemic species and genera is large, and the forms are in a number of cases distinctly archaic.

**Isle of France.** See MAURITIUS.

**Isle of Man, Wight, Grain, etc.** See MAN, WIGHT, GRAIN, etc.

**Isle of Pines,** island s of the w end of Cuba, to which it belongs. It is separated from Cuba by a strait about 35 m wide. Area, about 1,000 sq m. Its general shape is circular. The shore is much indented with bays, and there are many streams, some of them navigable for 3 or 4 m. The s half consists mostly of everglades. Mahogany and other kinds of valuable timber cover the hills of the n and beautifully colored marble is quarried. Pineapples, tobacco and potatoes are raised, though the chief industry is cattle-raising. Nueva Gerona, the capital, and Santa Fe contain nearly all the inhabitants. Columbus discovered the Isle of Pines in 1494. The buccaneers made it one of their favorite rendezvous. The ownership of the Isle of Pines was left unsettled by the treaty of 1903 between the United States and Cuba, and in the fall of 1905 the American colonists began to agitate for its annexation to the United States. In 1907 (April 8) the Supreme Court of the U S decided that the island was not American territory, p 3,199.

**Isles, Lord of the,** a title claimed by the descendants of Somerled (d 1164) of Argyll, who in 1135 obtained a grant of Argyll and Bute and other western islands of Scotland from David I, and who seized (1158) the Isle of Man. The descendants of Roderick, Somerled's grandson, obtained the northern isles, formerly belonging to the king of Man, and John of Isla (d 1386?) descended from Donald (and therefore surnamed MacDonald), eldest son of Reginald, assumed the title of Lord of the Isles. Donald (d 1420?), his eldest son, sought, with English aid, to maintain an independent rule of the isles, but after the battle of Harlaw in 1411 was compelled to surrender his claims. The lordship of the isles, annexed inalienably to the crown in 1540, now forms one of the titles of the Prince of Wales.

**Isles of Shoals,** eight rocky islands off the coast of New Hampshire, 10 m from Portsmouth. White Island has a revolving light 87 ft above the sea.

**Isles of the Blest, or Fortunate Isles,** were, according to ancient Greek conception, situated at the western extremity of the known world, and were the abode of those happy mortals who the gods decreed should be exempt from death. Homer appears to identify them with the Elysian Fields. Later ages identified them with the Canaries or Madeira. The Avalon of the King Arthur cycle is also a homologue of this classic myth.

**Islington,** borough of London, England, 2 m n of St Paul's. It includes the Agricultural Hall, erected in 1861, and the metropolitan cattle market, opened in 1855, and was the residence for some time of Sir Walter Raleigh, Charles Lamb, and the poet Collins.

**Islip, tn,** Suffolk co, New York (Long Island), on Great South Bay. Fire Island Lighthouse is opposite Islip village. The chief industry is the shipping of blue point oysters, p 18,000.

**Ismail Pasha** (1830-95), Khedive of Egypt, succeeded his uncle, Saïd Pasha, as viceroy in 1863, and in 1866 assumed the hereditary title of 'khedive,' and from 1873 possessed virtually sovereign powers. He initiated internal reforms, and spent large sums on roads, railways, telegraphs, and harbor works. 1874-5 he annexed Darfur and other districts in the Sudan, and endeavored, without much success, to suppress the Sudanese slave trade. In 1875,

under pressure of financial difficulties, he sold 177,000 shares in the Suez Canal to the British government for £4,000,000. But Ismail's reckless expenditure led eventually to a dual English and French control.

**Ismid** (anc *Nicomedia*), Asia Minor, near head of the Gulf of Ismid. It is the residence of Greek and Armenian archbishops, and was the ancient seat of the kings of Bithynia, p 20,000. See *NICOMEDIA*.

**Isobars**, lines connecting several places on the globe at which the barometric pressure is the same. See *METEOROLOGY* and *BAROMETER*.

**Isochronism**, the property possessed by any vibrating or oscillating system, a tuning fork or pendulum, which oscillates in the same time whatever be the range of oscillations. In virtue of this practical isochronism, tuning forks, stretched strings, and vibrating columns of air in organ pipes and trumpets give notes whose pitch, which depends on the period, is independent of the intensity. The dynamical condition which resists the displacement is proportional to the displacement. See *SOUND*.

**Isoclinal Strata**. In most mountain chains and in many plateaus of Palæozoic strata all the rocks have a similar dip, these, being equally inclined in the same direction, are known as isoclinal. Isoclinal strata are only found where the earth's crust has been subjected to considerable tangential pressure.

**Isoclinic and Isogonic Lines**, terms used in terrestrial magnetism to designate lines each of which is drawn through points at which a certain angle has the same value. In terrestrial magnetism each isogonic line passes through places at which the variation of the compass needle from true north is the same, and each isoclinic line passes through places at which the magnetic dip is the same. There are many other scientific terms formed on the same principle, such as isothermal, isodynamic, isentropic, isochromatic, isoperimetrical, etc., etc., the idea being the equality of a certain property or quantity. These may refer to lines or curves, graphically representing the corresponding state, or they may refer directly to the state itself. Thus when a thermal system undergoes changes of temperature, volume, and pressure in such a way that there is no change of entropy, then the state is isentropic. If, again, changes take place at constant temperature, the state is isothermal.

**Isodimorphous Substances** are such as are similarly dimorphous, and in each of their dimorphous forms they are isomorphous. To take an example oxide of antimony and oxide of arsenic are essentially similar compounds, both of them crystallize in the cubic and also in the rhombic system (dimorphism), and they can form mixed crystals, which belong to either system (isomorphism).

**Isoetes**, a genus, mostly aquatic, of the Isoetaceæ which stands almost at the highest point of development among non-flowering plants. *I. lacustris* is common in the northern parts of the world, submerged in streams and ponds.

**Isomorphism**. It was discovered by Mitscherlich, on examining the phosphates and arsenites of sodium, that substances of similar chemical composition are isomorphous, or exhibit the same crystalline form. Isomorphous substances have in general similar properties, and are capable of forming 'mixed crystals' and of 'overgrowing'. Mixed crystals are homogeneous mixtures of the isomorphous substances that are formed in any proportion without altering the crystalline form, while 'overgrowing' describes the power one isomorphous substance has of enclosing and continuing the growth of another. Thus, crystals of a mixture of magnesium sulphate and zinc sulphate are of uniform composition throughout, and have practically the same form as the crystals of either salt, whilst a crystal of chrome alum, if immersed in a solution of common alum, will have its growth continued by the common alum just as if the nucleus had been of the same material. Isomorphism has been employed as a somewhat uncertain guide in determining chemical similarities, but is much more useful as a means of mineralogical classification.

**Isopoda**, a very extensive order of Crustacea, whose members, though usually of small size, are of importance as marine parasites, and in the case of free-living forms as efficient scavengers. The majority live in the sea, but in addition to the fresh-water forms there are not a few terrestrial species, well exemplified by the common 'woodlouse,' or 'slater' (*Oniscus*) of gardens, the 'pill-bug' (*Armadillidium*) is an allied form.

**Isothermal Line**, is a line or graph whose characteristic is a constant temperature. Thus in meteorology, the isotherm is a line drawn on a map in such a way as to pass through all places having an assigned tem-

perature In physics, any graph which gives the law connecting two quantities at constant temperature is an isotherm

**Isotopes**, the various forms of a given chemical element, for example  $U_{234}$ ,  $U_{235}$ ,  $U_{238}$ , isotopes of uranium Uranium has 92 protons, one isotope has 143 neutrons  $92 + 143 = 235$ , this isotope is called  $U_{235}$

**Ispahan**, *city*, prov Irak-Ajemi, Persia It stands in the midst of gardens and orchards, and is connected with its residential suburb Julfa by a bridge spanning the river Zayendeh Under Shah Abbas (1586-1628), who made it his capital, it had a population of about 750,000 Many of the fine buildings erected by him still exist—the Royal Square, the Royal Mosque, the Hall of Forty Pillars The principal manufactures are those of calico, armor, tile, pottery, and gold and silver wares It has many famous Bazaars, including the Bazar of the Tailors, public baths, and mosques During the World War it was occupied first by Allied forces, then by Russians, following the murder of the Russian vice-consul in 1915, and finally in 1917 by British forces, p (including Julfa) about 90,000

**Israel** ('God persists') *Name and Racial Origin*—Israel was the name given to Jacob and became the collective name of the nation that sprang from him through his 12 sons After the revolution under Rehoboam it was adopted as the distinctive designation of the northern kingdom, but subsequent to the Babylonian exile it regained its national significance The name Jew, however, gradually predominated, although the Maccabæan princes engraved 'Israel upon their coins, and even in New Testament times it was still in use The Israelites were essentially a pastoral people This nation of shepherds, though unsophisticated in their habits of thought, had a genius for commerce, long latent, which did not escape the keen eyes of their own prophets Previous to the exile at least tribal prestige was more to them than national unity But by far the most notable feature about the Israelite was his religion In this sphere he has been of epoch-making importance in the history of the world Somewhere about 1500 B.C. that branch of the Hebrew group from which sprang the future Israel migrated into Egypt, having obtained leave to feed their flocks in Goshen Under Egyptian rule they retained their own language, religious rites, and habits of life, and were accounted rude barbarians While Genesis represents the

12 tribes as taking part in this movement to the pasture-lands of the eastern Nile delta, it has special stress on the connection of Joseph—Israel in the strictest sense—with Egypt In view of the silence of the monuments, it has been asserted that Israel was never in Egypt at all, but though the narratives in Genesis cannot claim to be contemporary history, they are doubtless true in outline That the leading characters are idealized, and their biographies colored by the conceptions of a later period, is only what was to be expected

Under a new Egyptian king, who 'knew not Joseph,' the Israelites were subjected to cruel oppression Not only were they forced to toil at public works, but measures were taken to prevent their rapid increase This harsh treatment was induced by their staunch adherence to their ancestral customs, and by the fear that they might ally themselves with the enemies of Egypt But a deliverer arose in the person of Moses, who stirred up the enthusiasm of his compatriots, and formulated his demand that the Israelites should be permitted to depart, their God having ordered them to observe a sacrificial feast at Horeb This Pharaoh refused, but in the end, owing to the plagues with which God visited Egypt, the Israelites effected their escape, avoiding the direct route to Palestine

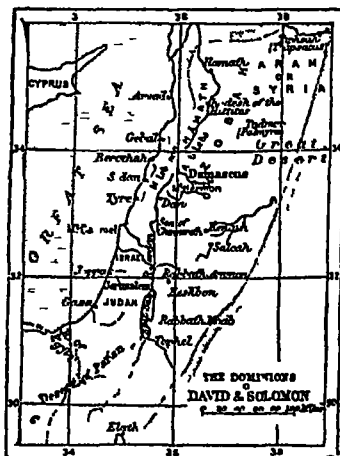
The effect of this deliverance, as seen in the song of Moses, was to create something of a national sentiment This was still further established when, under the leadership of Moses, the Israelites journeyed to 'the mount of God,' and entered into a covenant with Yahweh, in terms of which they became His peculiar people, and pledged themselves to serve Him alone and eschew the worship of images In its spiritual conception of God the Mosiac religion was raised far above the materialistic idea of deity bound up with the polytheistic and sensuous nature-worship of heathen nations The Israelites were also welded together by the observance of the legal principles instituted by Moses, their God is recognized as the dispenser of justice If not the lawgiver in the traditional sense, Moses was none the less so in reality, inasmuch as it was upon the rules laid down by him that all subsequent development and codification of the law was based There followed the period, covering practically a generation, in which the Israelites wandered in the wilderness, forming alliances with certain tribes and fighting with

others, but not advancing for the conquest of Canaan until after the death of Moses, who had appointed Joshua as his successor. The conquest was partially successful, and the question was settled, by the victories of the Israelites led by Barak and Deborah, as to which race was to be the dominant one. In many instances, however, some sort of understanding must have been arrived at, as in the period of the judges. Israelite and Canaanite are frequently found living amicably side by side—a state of matters that endangered alike the nationality and the religion of Israel. There was nothing like a general extermination of the Canaanites, on the contrary, there was a fusion of the two races. The transformation thus wrought upon Israel was great. From being nomads, they became farmers and merchants, from being strict monotheists, they got into the habit of frequently worshipping at heathen altars, from being comparatively weak, in a military sense, they found themselves able to put a considerable army into the field.

The Age of the Judges was a period of storm and stress, of external and internal feuds, in which individual heroism found conspicuous expression. It presents an alternation of periods of foreign oppression due to Israel's sin, and of deliverance and prosperity under a leader or judge raised up in response to their penitent prayers. There are six greater judges—Othniel, Ehud, Barak, Gideon, Jephthah, and Samson. The judges were local leaders, and not successors one of the other. The history given in the book of Judges is of events which must have been nearly contemporaneous, not successive. The Philistines, who had settled the southern seaboard, inflicted upon the Israelites a series of defeats, and Israel was utterly crushed in its own land, the temple of Shiloh destroyed, and a Philistine governor stationed in Gibeah. It became evident that the only hope of recovery lay in united action. Weary of anarchy and change, Israel must find a king under whose leadership it could regain national courage. Meanwhile, the people had a wise counsellor in Samuel, an aged seer, who having met Saul, the son of Kish, a Benjamite of Gibeah, 'a choice young man and a goodly,' announced to him his future kingship over Israel. Saul was proclaimed king at Gilgal.

Brilliant success attended the new monarch in the war of independence against the Philistines, which formed the chief busi-

ness of his reign. Saul carried out a prosperous campaign against the Amalekites, who were molesting Judah, but this success was more than neutralized by an unfortunate rupture with Samuel, which seems to have induced melancholia. David, the son of Jesse the Beth'lehemite, was introduced to Saul as one whose minstrelsy might soothe his troubled spirit, but after a while his presence aggravated instead of curing the king's disease. Meanwhile, on Mount Gilboa, Saul had been defeated by the Philistines. After seeing his three elder sons fall in succession, he threw himself upon his sword. This victory enabled the Philistines to push back the Israelitish sort of government to the east of Jordan. At Mahanaim, Abner, the leader of the Hebrews, crowned as king Saul's youthful son Ishbaal.



The sovereignty of Ishbaal was recognized by all the tribes except Judah, over which David, with the consent of the Philistines, then became king at Hebron. The elders of Israel finally offered to David the monarchy for which he had adroitly waited and planned. He at once transferred his abode from Hebron to Jebus (Jerusalem), a stronghold which was only then wrested from the Canaanites. He also brought to Jerusalem the ark of God, so restoring it to honor. After severe conflicts with the Philistines, he effected the complete liberation of his people, and the tribes at last really possessed the land of Canaan. Under David's sway his own tribe of Judah acquired a new prominence, and the Israelitish nation a splendor which remained an ideal possession for all time. The Israelitish kingdom became the leading military power

in Syria. This was, no doubt, largely due to the decline of Assyria and the temporary weakness of Egypt. In point of internal administration also, the Israelitish kingdom made great advance under David. He was a great man as well as a great king. Along with some serious weaknesses of personal character, he possessed true nobility of soul. His exceptional qualities of mind and heart are reflected in his poetry.

The reign of Solomon was characterized by the material splendor so dear to the Eastern despot. He married a daughter of Pharaoh, and, in contrast to the simple ways of his predecessors, introduced the luxurious appointments and customs of foreign courts, including the harem. Like Herod, he had also a passion for building and erected many fortresses. A monarch with such expensive tastes required a larger revenue than could be raised by the severest taxation. Forced labor was imposed, but this oppressive measure led to popular discontent, and ultimately to revolt. His instincts were those of the administrator and judge. Dividing all Israel into 12 districts, irrespective of tribal connection or racial origin, he set over each of them a responsible official, and so laid the basis of a detailed system of government. Solomon became proverbial for wisdom, justice, and riches. He also brought his country into closer contact with the civilized world, thus widening the intellectual outlook of his people. Nor can it be denied that he did a great service to religion by erecting the temple, albeit there were incorporated with the sacred cult heathen elements which many pious priests set themselves to eliminate.

The seed of discontent already sown in Solomon's reign blossomed into open rebellion in that of his son Rehoboam. When the latter, against the advice of his older counselors, harshly declined to lighten the fiscal burdens and to reduce the exactions of the corvée imposed by his father, the men of Israel chose for their king Jeroboam, the son of Nebat, who had been obliged to flee to Egypt for causing trouble in Solomon's time. Shechem became the capital of the new kingdom. The wrecking thus early of the union formed under David was, however, no doubt partly due to the old jealousies of the tribes. The breach was religious as well as political. The southern section of the Davidic kingdom ('Judah') was much smaller and weaker than the northern ('Israel'). Indeed, but for Jeru-

salem and the temple it could scarcely have maintained itself as a kingdom at all. In these it had, however, a priceless possession, which enabled it to outlive its more powerful sister state.

Civil war went on intermittently, but without any tangible result, during succeeding reigns. Baasah's son Elah was slain by his officer Zimri, but within seven days the latter was in turn compelled to give way to Omri, his commanding general. Omri found a rival in Tibni ben Ginath, and only the death of the latter left him in undisputed possession of the throne. During these rapid and revolutionary changes in Israel, he continued to reign quietly and worthily in Judah.

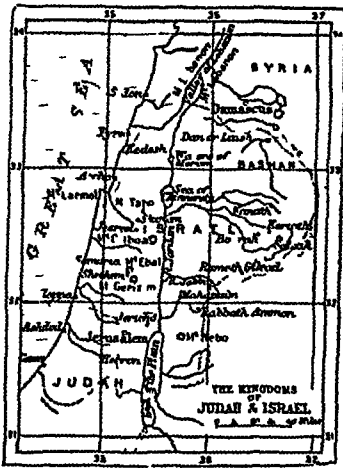
*The Syrian Wars*—Syria's leading motive for the war which she shortly made upon Israel was her desire for an outlet to the Mediterranean. In the attempt to secure this and other advantages, she was vigorously opposed by the dynasty of Omri. Under his son Ahab, the contemporary of Jehoshaphat of Judah, who was probably his vassal, the old feud between the two kingdoms was terminated by an alliance against the Syrians. During the reign of Ahab's son Joram the Syrians had siege to Samaria, and retired only because of a reported invasion of their own territory. The pendulum swung between defeats and victories for Israel and Syria until, under Jehorah, the third king of the dynasty established about 855 B.C. by Jehu, Israel recovered her lost territory by thrice defeating the Syrians. During this period the influence of the prophets, who preached against the deep moral and religious degeneracy of the national life in its time of prosperity, began to be exerted. Elijah had delivered Israel from Baal-worship. Now came the great prophets of the 8th century—Amos and Hosea in Israel, and Isaiah and Micah in Judah—whose theme was the impending judgment of Jehovah upon the apostate Israelitish nation. They formulated a virtually new conception of Yahweh as not merely the God of Israel, but the righteous Ruler of the world to whom moral evil, whether within or beyond the ranks of the chosen people, was utterly repugnant, and who delighted not in ritual but in righteousness. In the religion of Yahweh the main thing was not the national element, but the moral. That was independent of the earthly kingdom, and would not share its downfall. A century later this was still



more clearly asserted by Jeremiah and Ezekiel

Judah entered upon a period of great prosperity, as did Israel also under Jeroboam II, by whose prowess the ancient dimensions of the Davidic kingdom were restored. But the prosperity thus enjoyed by the northern kingdom did not last long. It was due largely to the temporary weakness of Assyria, and vanished upon the accession of Tiglath-Pileser III (745 B.C.). The interference of Assyria was to continue for the next 20 years until in 721 B.C. Samaria fell before the assault of Sargon. The ma-

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jority of the Israelites (27,290 in number) were removed to Mesopotamia and Media, and replaced by colonists from other vanquished territories. These combined with the remnant of Israelites to form the composite race known as Samaritans, whose religion, as a mixture of heathenism and Yahweh-worship, reflected the circumstances of their origin. The judgment announced by Amos and Hosea had come, and the kingdom of Israel was at an end.

The Kingdom of Judah still survived. Ahaz was succeeded by his youthful son Hezekiah (c. 715), who reformed the worship of Yahweh by limiting it to Jerusalem, and by removing the 'high places.' The most conspicuous figure in this religious revival was the prophet Isaiah, who developed with great power of intellect and imagination the thoughts of his predecessors Amos and Hosea. Although not a brave man, Hezekiah hearkened to an embassy from Merodach-Baladan, rebel-king of Babylon, urging him to throw off the Assyrian yoke. This exposed him to a great danger at the hands of

Sennacherib (701 B.C.). But just as Sennacherib's host was approaching Jerusalem, deliverance came in the form of a pestilence, which was said to have carried off 185,000 Assyrians in one night. At any rate, Sennacherib retired to Nineveh. Isaiah had triumphed, Judah was still, however, Assyria's vassal. Hezekiah's son and successor, Manasseh (686-641), reverted to the retrograde policy of Ahaz, and favored foreign cults and pagan superstitions. Tradition has it that under him Isaiah suffered martyrdom. Manasseh was succeeded by his son Amon, who shared his father's proclivities for idolatry.

The next king was Josiah, the son of Amon. He was only eight years old when he began to reign, yet within ten years there was an end of idolatry in Jerusalem and Judah. Through the cultus heathenish elements had entered into the popular life, and with a view to their effectual suppression the prophetic party, in alliance with the king and the priesthood, now secured the centralization of the Yahweh-worship. From this time the Deuteronomic law-book, embodying the prophetic spirit, and discovered by Hilkiah the priest at the purging of the temple, became the law of the community of Israel. The reform effected under Josiah proved, however, to be only external, it failed to touch the secret springs of national religious life. This was clear to Jeremiah, who was a leader in the work, and, indeed, the prophets of the period are at one in representing true religion as having reached a very low ebb.

The break-up of the Assyrian empire and the rise of the Babylonian were fraught with important issues for Judah. In the last decade of the 7th century Pharaoh Necho II marched towards the Euphrates, to secure Egypt's share in the partition of the fallen Assyrian empire. Judah became tributary to Egypt. The defeat of Necho by Nebuchadnezzar at Carchemish 604, brought Judah under Babylonian instead of Egyptian vassalage. But after three years Jehoiakim, in spite of the dissuasion of Jeremiah, revolted. Thereupon Nebuchadnezzar besieged Jerusalem, and the boy-king Jehoiachin, who had succeeded his father, was forced to surrender. In 597 B.C., along with the cream of the population, including the prophet Ezekiel, he was deported to Babylon. Zedekiah (Mattaniah) was appointed king over the impoverished remnant. He was foolish enough to join a con-

federacy against Babylon, with the result that Jerusalem was destroyed, the king made prisoner, and the bulk of the inhabitants removed (587 B.C.) Learning the vengeance of Nebuchadnezzar, the wretched remnant fled to Egypt, and compelled Jeremiah to accompany them. So ended the kingdom of Judah. The wreck of their temporal ambition, was, however, to be the prelude to a revived spiritual life, national disaster meant religious progress. The fall of the Jewish state was Yahweh's victory, and was in its effects the greatest step towards Christianity taken since the exodus.

The Babylonian exile was to last fifty years. The condition of the exiles was not one of extreme misery. Jehoiachin was ultimately set at liberty, and high official positions were held by expatriated Hebrews. A large number of them, particularly after the destruction of Jerusalem, decided to settle in Babylon, but the more spiritually minded among them yearned for restoration to the 'holy city.' During the exile literature was assiduously cultivated, and the scribe as a professional class became a potent factor in the national development. The return of the exiles to Palestine is associated with the name of Cyrus the Persian. In the first year of his reign (538 B.C.) he ordered the restoration of the temple at Jerusalem. As his legate, Shebazzar (probably uncle of Zerubbabel), a Davidic prince, and Jozadak the high priest together with a caravan of over 40,000 Israelites besides their servants proceeded to Jerusalem and laid the foundation of the second temple. Owing, however, to the opposition of the half-caste people of Samaria building operations were suspended until, in the second year of Darius (500 B.C.), at the instigation of the prophets Haggai and Zechariah, the work was resumed and carried to completion the dedication taking place about 486 B.C.

no further details of the great scribe's administration at this time. In 445 B.C., Nehemiah, the cup-bearer of Artaxerxes, obtained leave to proceed to Jerusalem, as governor of Judah, to repair its ruins and relieve the misery of its people. Although a layman, he was at one with Ezra in religious spirit and aims. His first concern was to restore the walls of Jerusalem. He next set himself to remove the crying grievances of the poor, and to recruit the population of Jerusalem from the surrounding district. Ezra again came forward as a teacher of the law which he read and explained to the assembled Israelites. The edition of the law-book thus introduced about 400 B.C. was virtually the Pentateuch as we have it, and its distinctly new feature was the so-called priestly code, Leviticus and the ceremonial sections of Exodus and Numbers, in which the exiled priests had detailed in writing the sacred ritual as practiced prior to the destruction of the temple.

Little is known regarding the history of Judah towards the close of the Persian dominion, but the transportation by Artaxerxes III (Ochus) of a portion of its inhabitants to Hyrcania seems to indicate that they had joined the Egyptians and Syrians in their revolt from Persia. In estimating the religious results attained during the Persian period, we are on firmer ground. The people had found in their common worship a strong bond of union. Under the guidance of Ezra and Nehemiah they had tacitly renounced the pursuit of political independence in favor of the far higher goal of the future glorification of Israel in presence of the heathen. The age was further characterized by a more spiritual idea of worship than had previously prevailed, by keen devotion to the law, by a distinct growth of national sentiment and by a new consciousness of sin. All this fits in well with the view that many of the psalms are to be dat-

surrounding nations continued, and many remained permanently abroad. Under Ptolemy Philopator (221-204) they suffered much. When, in 198 B.C., Antiochus III the Great defeated the Egyptians at Paneas, Palestine became part of the Seleucid kingdom.

Judaism had now begun to feel the aggressive influence of that Hellenic culture which Alexander's conquests had diffused over the then civilized world, but while the process of Hellenization went on in Judaea as elsewhere, it had there to face a strong antagonistic element. As the Greek party had captured the priestly nobility, they now attempted to Hellenize Jewish life even on its religious side. The high priest Onias III was superseded by his brother Jason, who purchased from Antiochus Epiphanes the sacred office, together with liberty to set up a gymnasium in Jerusalem. Within 3 years Jason was in turn supplanted by one Menelaus, who entirely abjured the Jewish faith, and in reward received military aid from Antiochus against the recalcitrant Jason. A false report that Antiochus had died in Egypt led Jason to attack Jerusalem and Menelaus had to take refuge in the citadel. The Syrian king interpreted these disturbances as a Jewish revolt, and, on his return from Egypt in 170 B.C., plundered the temple of Jerusalem and slew many of the inhabitants. Two years later, his general, Apollonius, devastated the city, and a Syrian garrison was placed in the fortress. An attempt was then made to extirpate Jewish rites and establish pagan customs by force. Those who refused to give up Jewish in favor of heathen practices were put to death. Rather than fight on the Sabbath, no fewer than a thousand let themselves be slain. But, unless the Jews were to be exterminated, such a policy had to be abandoned, and naturally there arose a fierce religious war.

The revolt was led by Mattathias, an aged priest, who, with his five sons, was joined by all who were ready to fight, even upon the Sabbath if necessary, for their ancestral faith. Acting on the aggressive, they began to stamp out heathenism from the land. At his death (166 B.C.), shortly after the war broke out, Mattathias bequeathed the leadership to his son Judas, surnamed Maccabæus (—'hammerer', hence the name Maccabæes as applied to his sons and descendants). This war of independence stands out as the most heroic episode in Israelitish his-

tory. It lasted for over 20 years, under one leader and another until in 143 B.C. Simon, a brother of Judas finally demanded from the Syrians, who had been forced out of the citadel at Jerusalem, complete independence for the Jews. The first year of Simon's reign was adopted as the commencement of a new era (Seleucid year 170 = 143-142 B.C.), the first Jewish coins were struck, and the 'yoke of the heathen was taken away'. Under his wise administration the country enjoyed a period of peace and exceptional prosperity. In 135 B.C. Simon and two of his sons were treacherously slain by his son-in-law Ptolemy, who coveted the supreme power. But Simon's third son, John Hyrcanus, governor of Gazara, anticipated him in the occupation of Jerusalem, and assumed the high-priesthood.

The reign of John Hyrcanus (135-105) was at first a troubled one, owing to the siege of Jerusalem by Antiochus VII, who imposed oppressive conditions of peace, but after the death of the Syrian monarch in B.C. 128, he successfully asserted his independence, and restored the Jewish kingdom to its ancient dimensions. This outward prosperity, however, was counterbalanced by much internal discord. It was in the reign of Hyrcanus that acute opposition was developed between the Pharisees and the Sadducees as political and religious parties. A dispute about succession to the throne finally involved the Romans, as both parties appealed to the man whom Pompey sent as his legate to Syria in 56 B.C. The matter ended in the siege of Jerusalem by Pompey, and the loss of Jewish independence. Hyrcanus II was appointed high priest and vassal prince (not king) over a diminished principality (63 B.C.). Patriotic Jews, who felt that Hyrcanus was only the tool of Antipater and the Romans, supported Alexander, the son of Aristobulus, in a vain attempt to secure the throne (57 B.C.). In order to dissolve the national unity, the proconsul Gabinius divided Palestine into five districts, but the spirit of revolt still lived on. In return for services against the Egyptian Ptolemy, Caesar appointed him procurator of Judaea (47 B.C.), and as a further step to power, Antipater made his eldest son Phasael governor of Jerusalem, and his second son Herod governor of Galilee. In 41 B.C., in face of considerable opposition, the two brothers were appointed by Antony tetrarchs of Judaea. A year later Antigonus, the only surviving son of Aris-

tohus, was set up as king by the Parthians. Phasael was made prisoner, and committed suicide, but Herod escaped, and with the aid of the Romans secured the throne of Judea (37 B.C.).

Two things Herod the Great, 37-4 B.C., deemed essential to the establishment of his power—the favor of the Romans, and the extermination of the Jewish dynasty. In both he succeeded. As a lover of pagan culture and a diligent builder of forts and cities, Herod was a notable figure in the Greek and Roman world of his time, while as the rebuilder on a magnificent scale of the temple at Jerusalem, he did something to recommend his dynasty even in the eyes of the Jews. In accordance with Herod's will, his kingdom was divided between his three sons Antipater, Philip, and Archelaus. To Antipater, 'that fox' who knew so well how to curry favor with the Roman emperors, was given Galilee and Peraea; Philip received the most northerly part of the trans-Jordanic territory, together with Ptolemais (Caesarea Philippi), while Archelaus, as the principal heir, obtained Samaria, Judea, and Idumea. Because of the severe vengeance wreaked upon his subjects who had opposed his claims before the emperor, Archelaus was dethroned and exiled in 6 A.D., his lands being attached to the province of Syria. Thenceforward, except under Herod Agrippa I (41-44 A.D.), who secured the territories of Philip and Antipater, and whose dominions were thus co-extensive with those of his grandfather, Judea was governed by a succession of Roman procurators. The Jews chafed under the insolence of Roman rule and during the procuratorship of Florus rose in revolt and appointed rulers of their own. At the date of Nero's death (68) the Roman general Vespasian subdued practically the whole of Palestine except Jerusalem. For nearly two years the capital had a virtual respite from external attack but was torn by internal strife. Meanwhile Vespasian had become emperor, and he commissioned his son Titus

in 135. His mature powers were shown after his return to Holland, where he became the painter-interpreter of the people, fishermen and peasants. Israëls was called the embodied strength of modern Holland by reason of his intense nationalism, his individuality, his independence, his deep human emotions, and brooding poetry of sentiment, in addition to his mastery of technique and color. His more noteworthy pictures embrace *Interior of the Orphan Asylum at Katwijk* (1867), *The Faithful Conrades* (1870), *The Village Poor* (1878), *The Struggle for Life* (1883), and *The Frugal Meal*.

**Issue**, in law, a controverted question of law or fact. The sole object of the pleadings with which a suit is commenced is to bring the parties to an issue, to define precisely the matter or matters as to which they are at variance. They are said to 'join issue' or to be 'at issue' when in the process of pleading they have arrived at a substantial and well defined disagreement as to law or fact. The issues between them are the points of difference so ascertained, and the function of the court is to try these issues and nothing else. See PLEADING.

**Istanbul**, since early in 1930 the official name for Constantinople, q.v.

**Ister**, ancient name of the Danube.

**Isthmian Games**, one of the great athletic festivals of ancient Greece, were held, in honor of Poseidon near the isthmus of Corinth. Their historical importance, if not actual existence, began about 550 B.C. The same contests were held as at Olympia (see OLYMPIC GAMES). The festival took place in the first and third years of each Olympiad.

**Istib**, town Serbia. The town was captured by the Bulgarians in October 1915 but recovered by the Serbians in 1918. p. 1, 622.

**Istria**, a crownland and maritime part of the former kingdom of Austria forming a peninsula at the head of the Adriatic Sea and in the Italian province of Venezia Giulia (see including the islands of Veglia, Cherso and Lussino).

18) being connected with the repairing, harboring, and provisioning of the Austrian naval forces. At the close of World War I, Istria was one of the disputed territories in the Adriatic controversy and was finally allotted to Italy.

**Isturiz, Francisco Xavier de** (1790-1871), Spanish statesman, was born in Cadiz. Because of the part he took in the revolution of 1820 he was forced to flee to England, where he remained till the general amnesty of 1834. After his return to Spain he became premier and minister of foreign affairs (1836), and president of the Cortes (1838). He was premier again in 1846, and Spanish ambassador at the Court of St. James (1850-4), at St. Petersburg (1856), and at Paris (1863-4).

**Iswar Chandra**, (1811-58), Bengalese writer and social reformer, of Brahman descent. In 1847 he published in Bengali the *Twenty-five Tales of a Betal*, followed by *Saluntala* (1855) and *The Exile of Sita* (1862). Appointed principal of the Sanskrit College, Calcutta, he devoted himself to educational and social reforms, including the remarriage of Hindu widows (1856). He labored incessantly to better the lot of Bengalese women, and was renowned for his charities.

**Itacolumite**, or **Flexible Sandstone**, a porous, friable sand-rock consisting mainly of quartz sand but containing a small amount of mica, talc, and chlorite. It is light yellow in color, and when cut into thin slabs is slightly flexible. Beds are found in the Southern Appalachians in the United States.

**Itagaki, Count Taisuke** (1837-1920), Japanese statesman, was born in Shikoku Island. He took an active part in the civil war against the Shogunate (1868), and after the restoration became an ardent advocate of representative government, establishing a school in his native province for teaching the people the principles of government. He organized the first political party in Japan and held several great offices of state. In 1898 he with Count Okuma formed the first cabinet of the Constitutional party. In 1900 he retired to private life.

**Italian Greyhound**, a miniature replica of the greyhound. The weight varies from four to nine pounds, and the color appears to have changed from time to time with the fashion. Blue and fawn are now probably the most popular. The points are the same as in the greyhound, but the body is somewhat fuller in proportion, and the nose shorter.

**Italian Language and Literature** See **Italy Language and Literature**

**Italics**, letters of Italian origin, as the name implies. They are said to have been in imitation of the handwriting of Petrarch, and were first used in printing by Aldus Manutius of Venice. They were cut for him by Francesco da Bologna, and used for his editions of the classics. The first book thus printed was the *Virgil* (1500), and between 1501 and 1558 six different sizes were produced.

More cursive than ordinary Roman type, and containing a large number of tied letters, italic type gradually came to be used for special purposes, such as introductions, prefaces, notes, quotations, and indexes, throughout a text of Roman type. The letters are now quite separate from each other. The type is used to distinguish words, phrases, or sentences which contrast in some way with their context, words from a foreign language, emphatic words which need the help of type to show their emphasis, and names of books and periodicals (thus, *The Old Curiosity Shop*).

**Italy**, a republic of Southern Europe, embracing the peninsula which extends south from the Alps, with Sicily and Sardinia and various smaller islands—Elba, Ischia, Capri. It is bounded on the north by Switzerland and Austria, on the east by the Adriatic Sea, on the south by the Mediterranean Sea, and on the west by the Mediterranean and France. The area amounts to 110,623 sq. m., of which 91,393 sq. m. belong to Italy proper, 9,936 to Sicily, and 9,292 to Sardinia. This is exclusive of the territories awarded Italy by the terms of the Peace Treaty.

**Topography**—Italy may be conveniently studied in five sections, (1) the Alps, (2) the basin of the Po, (3) the peninsula proper, (4) Sicily, (5) Sardinia. Of these Sicily and Sardinia are treated in separate articles (see SICILY, SARDINIA).

On the northern frontier the Alps sweep round in a mighty arc from Nice to Trieste, running out in places into Piedmont, Lombardy, and Venice. For the most part they rise steep and abrupt, except where their wall is pierced by long, deep valleys. Between the Alps and the Apennines spreads the broad fertile Lombard-Venetian plain, a nearly level country, which differs altogether in character from the peninsula to the south, and for a long period was politically distinct from it. Most of this great alluvial tract, which fills nearly the whole of Northern Italy, belongs to the

basin of the Po, it is irrigated by numerous streams and canals, and is one of the most fruitful and flourishing districts of Italy. The principal rivers are fed from the alpine lakes. The Po ranks for its volume of water among the notable rivers of Europe. It is navigable for 320 out of its 420 m., and several of its tributaries are also navigable. Many of these spread out at the foot of the Alps into considerable bodies of water, among which are the Lago di Garda (127 sq. m.) Lago Maggiore (81), and Como (58). These lakes are all remarkable for their depth.

The governing feature of the long peninsula, which stretches for 750 miles in a southerly direction, is the range of the Apennines. These, or their successive sections, break Italy up into several geographical or political divisions. South of the northern section—between the Tiberian Apennines and the Sea—is the narrow strip of the Riviera, with its picturesque scenery, genial climate, sub-tropical vegetation and string of maritime winter resorts (Bordighera, San Remo, Porto Maurizio, Nervi, Santa Margherita, etc.). There, too, are the seaport of Genoa and the chief naval port of Spezia. A little to the east of the last named is the gloomy lime-tone range of the Apuan Alps (6000 feet) which yield the valuable white Carrara marble. Beyond them lie the Tuscan highlands backed on the north by the Etrurian Apennines, which are crossed by a magnificent railway from Pisa to Bologna. The western seaboard of this district is the marshy stricken lowland (stretching east of Leghorn) known as the Maremma. Next comes the basin of the Tiber, flanked on the east by the Roman Apennines. These split into two chains—an eastern and a western, which reach its highest elevation in Monte Velino (5155 ft.). This is the rugged and formerly lawless region of the Abruzzi.

From Monte Amaro (5600 ft.), on the southern border of Tuscany, a volcanic belt

nine range continues southward to the extremity of the Calabrian peninsula.

The chief rivers of the peninsula flow into the Tyrrhenian Sea, but only the Tiber (for 90 m.) and, to a less extent, the Arno (66 m.), Volturno, and Garigliano are navigable.

On the Adriatic coast line running to over 2,000 m., Italy possesses five harbors—Venice, Ancona, Pola, Trieste, and Brindisi, and at the head of the Gulf of Taranto which divides the two peninsulas of Apulia and Calabria (the so-called heel and toe of Italy), she has the excellent harbor of Taranto, and on her western coast, besides a great number of small ports, the larger harbors of Naples, Civita Vecchia (the port of Rome), Isthmus, Spezia, Genoa and Porto Maurizio. Further, Sicily possesses the splendid harbor of Palermo, with others at Messina, Catania, Syracuse, Porto Empedocle (for Girgenti), Marsala, and Trapani, while Sardinia is chiefly served by Cagliari, with Oristano and Porto Torres.

The generally warm climate of Italy is considerably modified in places by the presence of the mountain ranges or the proximity of the sea. The plain of the Po open to the icy winds from the Alps and closed to those from the sea, has a cold if short winter while along the Riviera the temperature is as high as, and sometimes higher than, that of Rome or Naples. Throughout the peninsula the temperature is lowered by the presence of the Apennines, and some of the coldest districts of Italy are found in the Marche and in the Abruzzi uplands.

With regard to the rainfall a considerable difference is observable in the various sections of the country. In the very north there are but two seasons a wet and a dry whereas in Northern Italy there are two greater and two lesser rainy periods in the year most rain falling in October and in spring and least in winter.

The vegetation of Northern Italy is in the

is only in Southern Italy that the Mediterranean flora prevails

The fauna is extremely limited. A variety of fish and crustaceans occur, there are almost no birds.

**Minerals**—Sulphur, obtained chiefly in Sicily, is the chief mineral of Italy, the output amounting to more than a third of the value of the total mineral production of the country. Zinc and lead are mined in Sardinia, iron in Elba, and in some of the Alpine valleys, statuary marble at Carrara and Massa. Boracic acid is obtained in Tuscany, and salt is evaporated in Sardinia, Sicily, and various spots on the coast of Italy proper.

**Agriculture**—The predominating industry of the country is agriculture, although the industry groans under the burden of heavy taxation. Of the entire area 70 per cent is returned as productive, nearly half of this is under cultivation, and some 60 per cent of the working classes are engaged in agricultural pursuits. Maize is the principal crop of the n, though the production of rice in the Po Valley is of considerable economic importance. The chief crops of the s and of the islands, all of which are more backward than the n, are the olive (and olive oil), vine, and wheat, together with fruits (figs, oranges, lemons, almonds and chestnuts). Beets are grown for sugar, and tobacco, hemp, and flax are raised on a large scale.

The area and production of the leading crops in 1938 were (in metric tons of 2204 62 pounds) as follows: wheat, 8,091,800; barley, 247,800; oats, 629,100; rye, 138,800; corn, 3,000,000; sugar beets, 3,314,000; citrus fruits, 675,000; rice, 36,264 bushels; potatoes, 105,517 bushels; tomatoes, 2,341,506 lbs; tobacco, 90,389 lbs; cocoons, 70,444 lbs; olive oil, 78,720 gals; and wine, 898,238 gals. Efforts were being made to increase agriculture in Ethiopia, a colony, 1935-41.

Forests cover 12,220,306 acres. Large areas are devoted to hay and grass, and cattle, sheep, and goats are raised. Northern Italy is famous for its dairy districts, and large co-operative dairies have been established, especially in Lombardy, in Veneto, and in the valley of Aosta. The well-known Parmesan cheese is manufactured from Lombardy to Emilia, Gorgonzola in Lombardy, and Gruyere in Piedmont.

**Fishing** employs some 140,000 men, about 7,000 of whom are engaged in deep-sea fishing, principally off the coasts of Sicily, Tunis, Istria, and Dalmatia. The tunny is the most important fish economically and, after that,

the anchovy and sardine. Sponges are taken off Tunis and coral off Sicily.

**Manufactures**—Lack of coal and distance from the great markets of raw material have been a great handicap to Italian manufacturing, but great progress has been made in recent years in spite of these difficulties. The breeding of silkworms gives occupation to a great number of people in Northern Italy, the manufacture of silk being an industry of first importance in Como, Milan, Bergamo, Venice, and Northern Italy generally. Other important industries are the manufacture of cottons, chiefly in Northern Italy, Tuscany, and Campania of woollens more generally distributed, iron shipbuilding and engineering and mechanical workshops at Terni, Savona, Sempredarena, Naples, Pozzuoli, etc., and the manufacture of paper, olive oil, wine, sugar, tobacco, salt, hemp and linen yarns and tissues, leathers, hats, agricultural and other machinery, prepared meats, spirits, pottery and porcelain, glass (Venice), chemicals, and furniture. In the manufacture of small metal articles, pottery, enamel, faience and glass, requiring high artistic skill, Italy takes high rank. Milan is the busiest industrial center in the country.

**Commerce**—The commercial expansion of Italy, facilitated by her extensive seaboard, good harbors, and railroad connections, has kept even pace with her manufacturing development. The exports consist of silk, cotton, hemp, fruits and vegetables, wine, cheese, eggs, hides, sulphur, olive oil, automobiles, marble, art objects, and coral. The imports consist chiefly of coal and coke, wheat, raw cotton, boilers and machinery, timber, raw and manufactured silk and cocoons, wrought iron and steel, wool, cured fish, scientific and electrical instruments, hides and cattle.

**Railways**—The natural configuration of Italy, with the Apennine range through the center of the country, has led to the development of two great railway systems, one on the s w, along the shore of the Mediterranean, and the other on the n e, following the Adriatic. There are also a dozen branches and subsidiary lines crossing the Apennines, and connecting the trunk lines. The total railway mileage in 1938 was 14,230 of which 10,540 m were owned by the state.

**Population**—The total population of Italy, including the islands of Sardinia, Sicily, Elba, etc., was 45,800,000, in 1946. Since then it is estimated to have increased, especially through the return to Italy of at least 70,000 Italians who had been living abroad. The

emigration particularly to the United States has been in former years enormous. The number of Italians living abroad was estimated in 1911 at 9,600,000. Emigration still outbalances the return of citizens.

**Education and Religion.**—Public education is free, and is provided by the state, which maintains wholly or in part the public schools of all grades. It is compulsory from the ages of six to fourteen. Secondary education includes government schools, of several types, and private schools. There are 25 universities, ten dating from the 13th to early 15th centuries, among them Bologna (from the year 1200), Genoa (from 1243), Naples (from 1224), Padua (from 1222), Pisa (from 1300), Pisa (from 1318), Rome (from 1303), and Turin (from 1301). About 30,000 students attend these 25 universities.

Much progress has been made in the last 25 years in combating illiteracy, which was very great in the southern provinces.

The religion of the state is Roman Catholic, subject to civil authority. The officials of the church are appointed by the Pope, but government consent is necessary in the appointment of bishop and archbishop. Roman Catholics number about 41,000,000, with Protestants, 85,000 and Jews, 45,000.

**Government.**—Italy, a constitutional monarchy under King Vittorio Emanuele III, had a first Premier, Mussolini, who took over the powers normally held by a Cabinet and so dominated the government as to make its rule a dictatorship (See HISTORY section). The French of 1912 gave the vote for members of the Lower House to all male citizens over 21 years of age who can read and write, and to all illiterates over 30 years. In 1915, 18 years old and over were given the right to vote and voted, 1946. The country is divided into 16 departments and 69 provinces. The capital is Rome. July 25, 1941, Mussolini fell and Marshal Badoglio became

Somali land, with 139,000 sq m and 450,000 inhabitants (including the Benadir coast colony, for which Italy paid the Sultan of Zanzibar \$720,000 in 1905), Libya, 580,000 sq m, Dodecanese Islands, 981 sq m, Ethiopia, and Albania.

**History.**—The name Italy was originally applied to the southern extremity of the peninsula. During the age of the republic it was extended to the central provinces, the territory of the Apennines being known as Cisalpine Gaul. It was in the imperial period that the name first came to include the whole peninsula.

It is difficult to fix an exact date for the end of Roman and the beginning of Italian history. Barbarian invaders first penetrated into the country early in the 5th century, but it was long before they founded a settled government and titular 'Emperors of the West' still resided in Italy. In 476, however, Odoacer (Odoacer), a Herulian chieftain, deposed the last of these emperors and was proclaimed king of Italy by his followers, though he acknowledged the superior authority of the Eastern emperor. But under Odoacer, and under his conqueror and successor Theodoric king of the Ostrogoths (493), the Roman character of administration was little changed. Though himself an Arian, Theodoric was tolerant of Roman Catholicism, but the orthodox population after his death (526) gladly welcomed the restoration of the authority of the Eastern emperor, Justinian.

Two famous Greek generals Belisarius and Narces reconquered Italy, the latter defeating and killing the Goth chief Totila (552). The country was now governed by a Greek official called an 'exarch,' who resided at Ravenna, and Justinian's own code of law was introduced. But only a few years after the Justinianic era of invasions the Lombards came. They never succeeded in conquering the whole country, Venice though, and in 1454



dukes, but King Liudprand (712-744) succeeded in imposing the royal authority on them

The absence from Italy of any stable authority left room for an immense development in the power of the bishops of Rome, especially in their own city and the surrounding country. Though they still considered themselves subjects of the Eastern empire, they tried to assert their supremacy over the Eastern Church. Charlemagne, son of Pepin, called into Italy by Pope Adrian (773), conquered the Lombards, and was himself proclaimed king. Finally he was crowned emperor at Rome by Pope Leo III (800), and thus the authority of the Eastern emperors was wholly shaken off and a new empire set up to embrace all Western Europe.

This left Rome merely the nominal capital of a large empire, of which Italy was an outlying province. Her alien monarchs had little effective power, even when they were themselves in the country. There was complete anarchy in Italy until the establishment of the Saxon dynasty of emperors. Then Otto I (emperor, 962) and Otto III enforced a temporary submission upon all the country except the extreme south, and tried to reform the papacy, which had fallen under the control of the Roman aristocratic families, and was sunk in the lowest depths of vice and degradation. But directly their personal influence was removed, Italy relapsed into anarchy.

But in the latter half of the 11th century the church itself initiated that reformation which the emperors could not effect. The Hildebrandine reform, as it was called from the great churchman who was its moving spirit (see *HILDEBRAND*), must be studied as part of papal and imperial history, but as regards purely Italian affairs, its effects were momentous. In the war of investitures both parties strove to gain allies in Italy. The emperor was supported by most of the feudal nobles, especially the Roman aristocracy, who resented the independence of the reforming popes. The papacy found on its side the powerful Countess Matilda of Tuscany. Besides Matilda, the Normans of Southern Italy were allies of the papacy. To strengthen their hold on their new dominions, they consented to receive papal investiture for them, doing homage and paying tribute. But when, on the accession (1152) of Frederick I of Hohenstaufen (Barbarossa) to the empire, the papal-imperial quarrel broke out afresh, the strongest ally of the papacy was a new Italian force, that of the communes,

which during the last century had gradually been coming into prominence.

How much the towns preserved of their municipal organization from Roman times we cannot determine, but certain resemblances in their economic life seem at least to indicate a connection between the mediæval 'guild' and the Roman 'collegium,' and Lombard influence was less felt in the towns than in the country. The most advanced towns were the great trading cities of the coast, Venice, Genoa, and Pisa, which had wide commercial relations, especially in the East. At Rome, too, there was in the 11th century a curious but brief attempt to set up a republic, under the influence of a classical enthusiast, Arnold of Brescia. But by the end of the century the chief towns of Lombardy were sufficiently advanced to form a league of their own and assist the papacy against the empire. When the names of the rival German dynasties, Welf and Waiblingen, were transported to Italy as Guelph and Ghibelline, it was the Lombard league and the papacy which formed the original Guelph party.

Thus, when Frederick I reasserted imperial rights in Italy, especially the power to appoint officials and to collect taxes, and claimed Matilda's inheritance, he came into opposition with both the popes and the towns. From 1159-77 the struggle raged fiercely with varying fortune. Frederick had at first the help of some of the towns, jealous of the predominance of Milan. Milan was taken after a long siege, and razed to the ground (1162). Afterwards nearly all the towns were ranged against the emperor. They built a new city, and by the treaty of Constance (1183), extorted practical recognition of their autonomy. There followed for a century the great combat of civic independence and industrial progress pitted against the forces of feudalism. S. Italy fell under the rule of the new dynasty brought in from France, in whose hands the advanced stage of administration and civilization which had accompanied Hohenstaufen rule disappeared before a revival of feudalism, which was to characterize the country for centuries. Sicily soon (1282) broke away from the French yoke, and established a dynasty of Aragonese princes, thus for a considerable period cutting itself off from the history of Italy.

Meanwhile the fall of the Hohenstaufens, the long interregnum, and the weakness of the later empire left N. Italy free to develop along its own lines. Mutual jealousies and struggles for territorial expansion and commercial pre-



orate system of alliance and skilful diplomacy. This was largely the work of the Medici, and Lorenzo showed great skill in carefully holding the balance, and warding off the danger of French intervention. But this artificial arrangement had no real strength to hold Italy together, and it was Francesco Sforza, the ruler of Milan, who, out of personal hatred, invited Charles VIII of France to put into force the claims to Naples which he had inherited from the dukes of Anjou. Charles was young and adventurous; he swept across the country unresisted, allowing Florence to drive out the Medici and Pisa to recover her liberty, and Naples was his almost without a struggle (1494). Next Venice, weakened by the Turkish wars, in which she was fast losing her Eastern dominions, hated by every one for her greed and self-sufficiency, was attacked by a league of European powers, and lost her mainland dominions in a few weeks (1509). Though she regained her possessions when the league fell to pieces, she never recovered her former strength.

The next fifty years were mainly occupied with a struggle of France and her enemies for the Milanese duchy, which ended in 1559. This contest formed part of the European strife between her and the house of Hapsburg. Leo X, a Medici, obtained Spanish help to restore his family to Florence, overthrowing the republic which had been established there, largely under the influence of Savonarola. When the alliance of Clement VII, another Medici, with France had led to the terrible sack of Rome by German landsknechts (1527), Florence again revolted, but in spite of her brave resistance, she was recaptured, and was restored to the Medici, who afterwards obtained (1555) the title of grand-dukes of Tuscany.

After the fall of Florence there is little real Italian history to record. Italy seemed dead, exhausted by her early development and the vehement splendor of her short life. Her brilliant people were sunk in apathy under the rule of foreign princes, who, with complete disregard for their welfare, treated her states as counters in the diplomatic game.

In Savoy and Piedmont there was a semblance of national life, because the rulers were native, and governed with commendable uprightness. Territorial expansion was their constant ambition, and though often nearly crushed by France, and losing to her the western part of their dominions, they expanded eastwards into Lombardy, and took advantage of the war of the Spanish Succession to obtain Sardinia with the title of king (1719).

Venice and Genoa, losing the last of their Eastern possessions to the Turks, preserved the independence of insignificant Milan fell to the empire and went to Philip II of Spain in 1541. The European powers continued to treat it as their battlefield, with constant campaigns in which the natives had no interest, but in which they suffered heavily. Till the end of the 17th century Spain ruled the peninsula. Milan, Naples, and Sicily belonged to her, the smaller princes of Central Italy were under her influence, the papacy depended upon her as the leading Roman Catholic power.

The war of the Spanish Succession (1700-13) led to a change in the rulers of Italy, and to a slight change in her condition. Austria succeeded to the Spanish dominions, and though in 1738 she had to give up the Two Sicilies to a junior branch of the Spanish Bourbons, she remained the dominant power, controlling the smaller states.

It was the Napoleonic invasions which first stirred the lethargic mass into consciousness of life, forcing the ideas of the French revolution upon the people. In 1796 the conqueror first swept into Italy, driving the Austrians before him, Nice and Savoy he had seized for France, Lombardy and part of Central Italy he constituted into the Cisalpine Republic, and the Genoese district into the Ligurian Republic, after the French model. Venice he forced to surrender its liberty, and then tossed it carelessly to Austria as a bribe for acknowledging the independence of his republics. After his departure Tuscany and Piedmont were annexed to France, the king of the latter retiring to Sardinia. When the Austrians again invaded Italy, the unstable republics fell rapidly before them, but in 1800 Napoleon returned, bringing his whole army over the St Bernard pass. Defeating the Austrians at Marengo, he re-established the Cisalpine (now called the Italian) Republic, of which he himself became president. Venice was taken from Austria, Naples was made a kingdom first for Joseph Bonaparte, then for Joachim Murat (1808), the temporal power of the popes was abolished.

It was for the Italians a time of great material prosperity, and a civil liberty hitherto unknown, though there was little political liberty, since, after Napoleon became emperor, he was crowned king of Italy, and the constitution of the Italian republic fell into abeyance. The kingdom of Italy fell with its king. The old governments were restored, Venice falling to Austria, Genoa to Savoy. The former rulers came back determined to crush out



sea at Lissa, the triumph of Prussia was so complete that, by the Peace of Prague, Venice was surrendered to Italy.

Rome it was less easy to secure because of the opposition of Roman Catholic opinion throughout Europe. French soldiers had protected the Pope since 1849. In 1862 Garibaldi prepared to make a dash on the Papal States, but the government felt obliged to stop him. He was surrounded on Mount Aspromonte and taken prisoner. The withdrawal of the French troops from Rome (1864) was only procured by a promise to respect the Papal States, and by the transference of the capital from Turin to Florence. In spite of the prohibitions of the government, Garibaldi made another attempt on Rome in 1867, but Napoleon sent more French troops, and Garibaldi was defeated at Mentana, and forced to withdraw.

It was not till the fall of the French empire, in 1871, that the Italian government could act freely. As Pius IX refused to give up the temporal power, the Italian government took the capital by force, and Pius withdrew to the Vatican, where he remained in voluntary confinement, a course followed by his successors Leo XIII, Pius X, Benedict XV, and Pius XI, until the establishment by the Lateran Treaty in 1929 of the Vatican City.

Victor Emmanuel II (King of Sardinia, 1849, of United Italy, 1861-78) devoted himself to the development of internal affairs and the maintenance of peace. Humbert (1878-1900), his successor, well-intentioned and generous, but not great, was beloved by his people. During his reign the Triple Alliance (see ALLIANCES) was formed, and twice renewed. During his reign, also, considerable effort was made to develop a colonial dominion on the Red Sea coast. Waste of money and disaster was the result, culminating in a terrible defeat at the hands of the neighboring Abyssinians at Adua (1896), in which 4,000 Italians were killed. When Humbert was assassinated by an anarchist on July 29, 1900, his only son succeeded to the throne as Victor Emmanuel III. On Dec. 28, 1908, a terrible earthquake, followed by a tidal wave, almost completely destroyed Messina and Reggio.

Until the advent of the Young Turks to power in Turkey, the foreign policy of Italy had been concerned mainly with Austria, her traditional enemy in spite of the Triple Alliance. The German demonstration at Agadir, Morocco, in July 1911, showing that the Powers were bent on settling the status of the North African States, caused Italy to turn

toward Tripoli lest it should be invaded by the French from their neighboring protectorate of Tunis. At Tripoli Italy had certain concessions which were being abused by the Turks. Italy sounded the Great Powers as to her move to protect her rights, and with their consent she issued an ultimatum to the government at Constantinople announcing her intention to occupy Tripoli and Cyrene, war was declared on Sept. 29, 1911, and within a week the Tripolitan coast had been blockaded, the port of Tripoli bombarded and captured, an army of 40,000 Italians landed, and a number of small Turkish war vessels sunk. A Royal decree issued Nov. 5 annexed the territory to the Italian Crown. In the southern Ægean the Dodecanese Islands, including Rhodes, were occupied.

By the end of December, 1911, the Powers realized that Turkish resistance to the invasion of Tripoli was ineffective and succeeded in inducing the Ottoman Empire to cede Tripoli and accept an Italian indemnity. Peace was agreed upon at Ouchy, Switzerland, Oct. 15, 1912, and signed at Berlin, Oct. 18. By this treaty the Porte acknowledged the sovereignty of Italy over Tripolitania, henceforth to be known as *Libia Italiana* (Tripoli and Cyrenaica) while Italy was to surrender the Dodecanese when Turkey had completely withdrawn from Libya. During the War the Triple Alliance had been renewed for twelve years after its expiration in 1914.

The electoral law of 1912 made universal manhood suffrage effective, only the illiterate with unfinished military service being barred. This increased the electorate from three to eight millions and the Socialist vote from 329,000 to 825,000.

Scarcely had the country settled down after the brief war with Turkey than Serbia's ambitions threatened peace. In November, 1912, she had announced her intention of securing a port on the Adriatic and later had taken possession of Durazzo. Serbia being closely allied to Russia, this move threatened Italy's sphere of influence on the Adriatic. Austria-Hungary was also deeply interested and with Germany, through the Triple Alliance, demanded that the *status quo* on the Adriatic be not disturbed. The autonomy of Albania was declared necessary to the European Concert, and this declaration was accepted by the London Conference, Dec. 20, 1912. On Aug. 9, 1913, Austria notified Italy of an intended attack upon Serbia and ordered fulfillment of the pledge of the Triple Alliance. This Italy refused on the ground that Austria would be

the accession and that the Alliance was for defence only. A year later when the assassination of the Archduke Ferdinand and his wife at Sarajevo could do this Austria's ultimatum to Serbia and plunged all Europe into war Italy took the same stand refusing to join her. After Germany and Austria, on the ground that they were not one of the victors.

In 1914, serious financial conditions, unemployment, and a loss of morale and interest in the Turkish War had caused the dismissal of the Giolitti government on March 20 and a new cabinet was formed by Salandra on March 24.

It was this government which led the celebration of neutrality on August 3. The question whether it should be a people and government or a refusal to this policy was whether Italy continue neutral, or enter the war on the side of the Entente? Opinion and policy differed but whether it became obvious that sufficient compensation could not be received from the Dual Monarchy. Italy opened negotiations with the Entente Powers at London. On April 18, 1915 she presented her minimum demands: the restoration of the northern boundary of 1914, the regions of Gorizia, Gradisca, and Trieste, part of Dalmatia with adjacent islands and the surrender of Austrian rights in Albania. For these concessions Italy was prepared to pay 200,000,000 lire in gold and to remain neutral throughout the war. Austria declined, and on April 6 Italy joined the Pact of London.

Although the Pact was secret, sufficient of it had been published to cause transportation to produce serious public reactions. There were anti-interventionist and pro-interventionist demonstrations, and finally on May 5 Italy formally withdrew from the Triple Alliance, and twenty days later declared war on Austria thus conforming to the terms of the Pact of London. (See *Italy, World War I*.)

Peacemaking in the Trentino in 1916 resulted in the overthrow of the Salandra ministry on June 11, and the organization of a coalition ministry, headed by Signor Boselli. War was declared on Germany August 5. The new government was much criticized but maintained itself in power until the disaster at Caporetto, when it fell, and a new ministry was formed by Vittorio Orlando Oct. 30, 1917.

The fortunes of war now began to swing from the Central Powers to ward the Entente, and Austria came to the verge of collapse. The Czechoslovaks claimed independence and were recognized by Italy, July 1, 1918 and three months later Italy refused to consider

Austria's peace offer and he on Oct. 24 the Battle of Vittorio Veneto which was rapidly becoming a triumphal march when on Nov. 3, 1918 an armistice was signed.

Italy's major formal claim for a partition and presented them to the Peace Conference. Her claims included the Trentino as far as Brenner Pass, all of the Southern Tyrol Trieste, Istria, Fiume, Zara, Sebenico, Dalmatian Islands, Albania, Albania and the Dodecanese Islands in the Aegean. The first contest claimed consisted with the claims of Yugoslavia (see *Yugoslavia*) and the claim to the Dodecanese Islands with the claims of Greece.

The dispute with Yugoslavia became bitter. President Wilson stood firmly against the transfer of Fiume to Italy, and the ground that the surrounding territory was predominantly Yugoslav, and that Serbia had no other port available. Italy set her claim on the Pact of London of 1915, and on the fact that Fiume was a predominant Italian and had voted with Italy in 1918 in April 1917.

On Feb. 7, 1919 the United States recognized the political entity of the Kingdom of the Serbs, Croats and Slovenes (Yugoslavia), and the next day the Conference recognized the Serb claim to the representation of Yugoslavia. Upon President Wilson's insistence that Fiume should go to Yugoslavia the Italian delegation went to Rome and after receiving the support of the Chamber for its attitude at the Conference returned and signed the Treaty of Versailles. Meanwhile, Fiume had become the center of the international stage. On Sept. 12, Annunzio and his followers occupied Fiume until after the signing of the Treaty of Rapallo (Nov. 21) between Italy and Yugoslavia when in December, 1920 he surrendered the city to an Italian general. See *Fiume*.

The war in 1920 opened with the Nitti government still feeling in a moderate attitude with England and France in regard to the Adriatic problem. In March Nitti was obliged to reorganize the Cabinet which on May 1 was outvoted, 193 to 112, and resigned. After several further attempts at reorganization Nitti was defeated, and on May 21 resigned. On June 16, Giolitti, the old leader of the Liberal and Democratic factions, was made Premier with Count Sforza as Foreign Minister. The latter undertook to settle the Fiume question by making obvious concessions to Yugoslavia, which the country was in no mood to entertain, and to cement the protectorate of Italy over Albania which had been proclaimed three years before by General Ferrero. The radical

attitude of Parliament permitted no reinforcements to be sent to Albania, however, so the Italian forces were driven from their posts and finally evacuated Valona (Avlona), holding only the island of Saseno off the harbor.

About this time the middle class began to assert itself. Lacking a rallying point, it had so far been indifferent to the conflicting political issues and even to Communism and anarchy. A rallying point, in the shape of the Fascismo of Mussolini (see *FASCISM*) now presented itself, as the avowed enemy of Communism and the proclaimed upholder of the law.

In June the unpopularity of Count Sforza's foreign policy became manifest and Giolitti with the rest of the cabinet resigned rather than attempt to palliate it, and on July 4 he was succeeded by Ivanoe Bonomi, a former militant Socialist and editor of the *Avanti*. The last four months of the year were filled with sporadic clashes between the radicals and Fascismo, principally fatal in Modena, Rome and Trieste. The whole year was significant as being the 600th anniversary of Dante's death, with memorial observances all over the world, and with special ceremonies at Ravenna, and in Florence.

Toward the close of 1921 a conference of 200,000 Fascists was held in Rome where an attempt was made to eliminate the irresponsible element, and a definite political organization was established with Benito Mussolini at its head. His avowed objects were the destruction of Bolshevism, the reorganization of the country's economic forces, and the rehabilitation of Italian influence abroad. Under his direction the Fascists early in 1922 began their work. They met the organized terrorism of the radicals with better organized violence, and their methods to provide against strikes and to combat Communism revealed for the first time the constructive elements of Fascismo at work. A second congress of the organization held in Naples showed both the militant and popular power of Fascismo and a unanimous disposition to delegate this power to one man—Mussolini. Meanwhile, in February Bonomi had resigned, and was succeeded by Signor Facta. From July 19 until he finally resigned in October, Facta reconstructed the cabinet three times.

Owing to the inability of the government to establish order, to the struggle between Fascismo and the radicals for supremacy, a triple choice now confronted the king: should he surrender the throne to the Reds, should he take the advice of the Facta Ministry and

help to bolster up the old order by declaring martial law (either of which meant civil war), or should he summon to Rome to form a government the most popular man in Italy, a man who, because of this popularity, could regenerate both the Royal prerogative and the prestige of the nation. He chose to accept the resignation of the Facta government, and to summon Mussolini to Rome, where, on Oct. 29, he took the oath to sovereign and constitution, and formed a new government. In spite of fears abroad and the demands of extreme Fascists the new Premier proceeded cautiously: he neither defied Yugoslavia, annexed Albania, nor challenged England's right to Malta. On the contrary, he summoned a coalition ministry and merely set about correcting the abuses of the old order, at the conferences of Lausanne and London he asserted the claims of Italy in a dignified but firm manner.

Early in its career the new government obtained from sovereign and Parliament the grant of plenary powers from November 1922 to December 31, 1923, by which it could govern by decrees. The decrees which emanated were reformatory, corrective, and measurably constructive, but not revolutionary. In November a new electoral law was promulgated, based on the principle of securing majority rule in the Chamber without constant obstruction to legislation due to mixed minority representation. By this law the party which obtained 25 per cent of the total number of votes was to receive two-thirds of the 535 seats, the balance was to be divided among the other parties in proportion to the number of votes each cast. The election held in April, 1924, gave the Fascista government 375 of the 535 seats. Although the obvious object of this law had been to produce a practically unopposed government majority, there is no doubt that this majority represented the almost unanimous will of the people.

On Dec. 31, 1923, Mussolini had resigned the dictatorship, and the expiration of the government's plenary powers had left this alternative: either a continuance of those powers or a law providing it with a sympathetic legislature. When two years later, accusations came from the dwindling opposition and from publicists abroad that the Chamber of April, 1924 no longer represented the will of the people, a new law was promulgated, in January, 1925, reviving, with some modification, the old electoral system, but by this time Fascismo was strong enough to make this concession to its opponents.

Nevertheless, the year 1924, which marked

the transition of Fascismo from a reform to a revolutionary government, was not to pass without a conspicuous although transitory loss of prestige to the institution. When Fascismo first came into power it had neither press nor news bureau. In the creation of the latter certain delinquents were employed, who turned the bureau into a 'Cheka' for political and personal vengeance. Members of this 'Cheka' kidnapped and probably murdered the Socialist leader Matteotti in June. The arrest of their instigators caused confessions from the latter that Mussolini 'had known all about it'. Three months of acute crisis followed in which there were increasing demands for a return to the old order answered by a reorganization of the government and its branches and the entry of Liberal members into the cabinet and ending with the murder of the Fascist deputy Craxolini.

In November, 1925, the funding of Italy's war debt to the United States somewhat revived Mussolini's prestige but the year ended with a sharp fall in the exchange value of the lira and a feverish suspense, even among the supporters of Fascismo, as to the outcome of the Matteotti investigation. On the other hand, the appointment of a committee of 15 to reform the national constitution showed that the time had passed when Fascismo might have surrendered to the old order with its pseudo normalcy. From a national corrective agency, it had become a reformative, from reformative it was now proceeding to establish a new theory of government by the 'aristos,' or best.

Aside from the funding of Italy's war debts to the United States and England, 1925 was marked by a trade treaty with Germany, the settlement of the Jubaland dispute with England, and the recognition of Italian sovereignty over the Egyptian territory of Jarabub. In this year there was a second attempt to assassinate Mussolini. The fifth attempt made in October, 1926, inspired a revival of capital punishment, for attempts against the life of the sovereign or his Prime Minister.

This year also saw an increase in the prestige of Fascismo and Mussolini, both at home and abroad. The Fascista Labor Bill of March brought all labor unions and capital corporations under the laws and prohibited strikes and lockouts. Early in 1927 definite steps were taken both by the government and the Council of Fascismo to root out the most violent and intransigent elements from the organization.

The first half of 1927 was particularly

memorable as showing the economic and cultural results of the Fascista regime. In February there was an active readjustment of Italian national finances under Count Volpi, the finance minister, the consolidation of the floating debt was carried out without any disturbance of business, the Lictor Loan produced over \$300,000,000, mostly from subscriptions of less than \$1,000, reports of 1926 showed that the hitherto unfavorable trade balance had been reduced, that the harvests had been abundant as never before, due to scientific cultivation, and that importations of coal had been reduced on account of the augmentation of water-power. Finally, without any official announcement of stabilization, the government decided to preserve the lira at its current exchange value—about 20 to the dollar.

On the 2,681st anniversary of the founding of Rome, a 'Charter of Labor' was promulgated, completely changing the status, functions, and character of the government in all departments. After various cabinet reorganizations dating from the Autumn of 1923 when the portfolios were reduced from 16 to 9, the title of Benito Mussolini, Duce of Fascismo, became 'Head of the Government' with the portfolios of State, Foreign Affairs, Interior, War, Navy, Aeronautics, and Corporations.

Since Fascismo swept away the old order of things in Italy and introduced a new political system of national organization, the dynamic figure of Benito Mussolini had overshadowed the King and every branch of government. It may be pointed out that not every one in Italy was a Fascist, to become one it was necessary to enroll, take the oath, and pay dues. Those who were not in sympathy with Fascismo had to keep their dislike a secret, for there could be but one political party—that of Fascismo—all others were sternly prohibited.

The rigorous censorship of the press enforced by Mussolini provoked the editors and publishers of suppressed newspapers in Italy to file a strong protest with the Secretariat of the League of Nations (1927) for submission to the International Press Conference, asserting that such censorship was a barrier to international understanding and also harmful to the interests of Italy.

In 1928, the old governmental plan of election to assemblies was done away, and the Fascist Grand Council, comprising 35 to 40 members, headed by Premier Mussolini, became the deliberative court empowered to select candidates, now reduced to 400 in number. These 400 are selected by the Council.



from numbers suggested by Fascist organizations and productive industries to represent, not geographical constituencies, but all of them—the nation—as a whole. Candidates may also be nominated (not more than 200) by cultural associations, in addition to which, the Grand Council may also select candidates outside of the lists presented to it. The list of the 400 being finally decided upon, they are presented to the electorate in one block, and the voter can but register 'yes' or 'no' to elect or reject at once 400 candidates. The novel method of voting for a corporate legislature was first tried in the elections of March, 1929 and resulted in a Fascist victory.

It was not until 1928 that the Grand Council, after being in existence for six years, secured a legal standing in constitutional law. By special legislation this body was designated 'the supreme organ of government,' service on which is gratuitous and privileged, the Premier convokes it, presides, and dictates the agenda. No quorum is required, its meetings are secret and all its decisions valid in law.

Friction developed during 1928 between Church and State over education. A great organization of Boy Scouts (the 'Ballila'), had grown up under Fascism, besides which there was also a 'Catholic Boy Scouts' organization. As Fascism claimed absolute monopoly in the training of youth, the Catholic Scouts were regarded as an encroachment on State preserves. The Government took steps to end the anomaly and harsh criticisms passed between Vatican and Fascist newspapers. A compromise was finally arrived at, and the Church was left in charge of religious instruction and the Government's functions limited to physical and cultural education.

Perhaps the most ambitious achievement of Premier Mussolini was the settlement of the old feud between Church and State which had smoldered ever since 1870. At the Lateran Palace in Rome, on Feb. 11, 1929, representatives of the Government and the Vatican met and signed the historic document which, in a limited measure, restored the temporal power of the Popes. Premier Mussolini represented the King, and Cardinal Gasparri, Pope Pius XI. The instrument then signed formed a concordat designed to regulate all future relations between the Kingdom and the Holy See. King Victor Emmanuel signed the document on May 27, and it became law on the following day. See VATICAN CITY.

Vital statistics of the Italian people were published in May, 1930, by the Central Statistical Institute at Rome. The population,

according to the census of Dec. 31, 1928, was 41,168,000, Italian-born residents outside of the Kingdom and in the colonies were given as 9,168,367, of which number 7,674,583 resided in North and South America, in European countries there were 1,267,841, in Africa, 188,702, in Oceania, 27,657, in Asia, 9,674. Counting the totals, it appeared that there were about 50,000,000 Italians in the world, and it was stated that the home population was normally growing at the rate of over 400,000 annually. Speaking in the Chamber of Deputies in May, 1927, Mussolini predicted a home population of sixty millions by 1940.

The Naval Limitation Conference held in London in 1930 left in its wake a serious controversy between Italy and France. After almost a year's negotiation, it was announced in March, 1931, that the two nations had arrived at an agreement. As published, the terms gave France a total tonnage of 670,000 and Italy 441,000 in 1936, and an efficient tonnage of 586,000 for France and 436,000 for Italy, leaving France a 150,000-ton margin of superiority.

Industrial affairs claimed the chief attention of the Fascist leaders in the early months of 1933, with new laws regulating private capital, the abolishment of the Chamber of Deputies, with the transfer of its powers to the newly created Council of Corporations, and new trade agreements. Repeating that his aim was international peace, Mussolini endeavored to put into operation a Four-Power Pact which should seek to maintain, through an agreement between France, Germany, Great Britain, and Italy, an era of peace in Europe for ten years. Laws governing farming groups were put into operation near the end of the year, and a Soviet-Italian treaty of non-aggression and trade was signed.

During 1935, Mussolini's interest in foreign relations continued. Incidents that had occurred on the border of Italian Somaliland and Ethiopia were the forerunners of war, and troop shipments to Africa were increased, while Ethiopia appealed to the League, at the same time asserting readiness to fight if need be. England's answer was to mass a powerful fleet and air force in the Mediterranean, while the League of Nations prepared to impose sanctions. At home Mussolini stressed the building up of organizations for youth to enroll boys from eight years old up and the importance of the family, with preference for married men in official positions and constant encouragement of increase in the size of the family. By the first part of April, 1935, both

Italy and Ethiopia were concentrating troops near the border Sept 10 Mussolini ordered mobilization of 10,000,000 Italians

Under General Emilio de Bono, on Oct 6, 1935, Italian troops captured Aduwa Rome was also notified of the capture of nearby Adigrat, and of Wayeta by the Italian Eastern Army operating on the French Somaliland border Makale was taken by General de Bono on Nov 13 Addis Ababa was captured on May 5, 1936, and May 9 Mussolini proclaimed that Ethiopia had been annexed to Italy Ethiopia fell on Nov 27, 1936

The Rome-Berlin-Tokyo Axis was established in 1937, and Mussolini became insistent for a share of the Mediterranean possessions and interests of France and Great Britain His hand was strengthened in 1939, by Franco's victory in the Spanish Civil War In 1939 his armed forces grabbed Albania

Public opinion in Italy was strongly opposed to Communism Thus, the announcement that Germany had signed a pact with Russia in Aug, 1939 tended to weaken the bonds between Italy and the Nazis However, on June 11, 1940, when Germany had beaten France to her knees, Mussolini declared war on France, lining up with the Nazis In the fall of 1940 Italy invaded Greece but her troops were routed and she was held at bay along the Albanian coast In the spring of 1941 Germany came to her rescue and Greece was defeated In Africa the English overran Entrea and Somaliland and early in 1940 drove the Italians out of eastern Libya but retreated to Egypt when Nazi troops reinforced the Italians Nov 7, 1942 American forces landed in French N Africa, and by May 12, 1943, the Allies had driven Germans and Italians back to Europe Next, widespread air raids were aimed at Italian territory, Sicily was seized and Southern Italy invaded Mussolini resigned July 25, and Marshal Pietro Badoglio became prime minister In September Italy surrendered The Allies set up a military government, assisted by the Royal Government, whose head was Crown Prince Umberto, King Victor Emmanuel III went into retirement Gradually the Allied armies gained ground in central Italy In April 1945 Mussolini and some of his followers were caught and executed Italy became a republic in 1946

**Italy Language and Literature** Italian is one of the Romance languages, and was the latest in developing from the Latin For a variety of reasons, literary and political, Tus-

can (and especially Florentine) has been the classical literary tongue of the peninsula almost from the beginning of the national literature

The earliest monuments of Italian literature belong to the first half of the thirteenth century The first important and collective phenomenon is the mass of lyrical poetry produced by the Sicilian school This derives directly from the Provençal troubadours, and it was at Palermo, at the brilliant court of the Emperor Frederick II, that the Provençal methods were first translated into Italian In the second half of the century the seat of this lyrical poetry was transferred to Central Italy, while Northern Italy showed a preference for didactic and moral subjects

Italian prose begins about the year 1250 In addition to a number of translations, we have the epistles of Guittone of Arezzo, divers chronicles, didactic works, and, above all, the short tales collected under the titles *Conti d'Antichi Cavalieri* (20) and *Novellino* (100)

If we regard the foregoing as the period of the beginnings, we may roughly characterize the period that follows (1283-1348) as the age of Dante Guinicelli had introduced thought into his lyrics, and this mingling of idealized love and philosophy was developed in Tuscany by the school of the *dolce stil nuovo*, whose foremost representatives were Guido Cavalcanti (1265-1300) and his friend Dante Alighieri (1265-1321) The most perfect expression of the lyrical movement is to be found in the *Vita Nuova* and *Canzoniere* of Dante Beautiful as are these works, and important as is the *Convivio* for the history of philosophy, the *De Vulgari Eloquentia* for the history of philology, and the *De Monarchia* for the history of the church and state, it is the *Commedia* (called *Divina* by posterity) that entitles Dante to rank as the greatest poet of Italy, and as one of the three masterpoets of the world For passion and wisdom, for style, and as the expression of a mighty personality and of a great age, this wondrous narrative of a journey through hell, purgatory, and paradise has never been surpassed Needless to say, the fact that Italy produced her greatest literary work at so early a period was an important factor in the fixing of her literary language, while Dante's style, chastened on the model of the classics, was the earliest fruit of modern classical study, and a mighty harbinger—if, indeed, it was not the starting point—of the Renaissance

The next hundred years paved the way for the Renaissance. Humanistic studies may be traced back into the 9th century, but if we exclude Dante, the first important Italian humanist was perhaps Albertino Mussato (1261-1329), with his Latin chronicles and the Latin tragedy *Eccerimis*. Giovanni del Virgilio is interesting chiefly for his bucolic correspondence with Dante. Far greater than these was Francesco Petrarca (1304-74), whose familiar epistles, historical fragments, *Africa* (an epic), and contemplative works are written in Latin, and testify to a great knowledge of all pertaining to Rome. Greek studies, too, were furthered by him. But it is, of course, as a lyrical poet that Petrarch has come down to posterity, and that his influence throughout Europe was so prodigious. The next mighty figure of the classical revival is Giovanni Boccaccio (1313-75), whose Latin works on the genealogy of the gods and on the famous men and women of antiquity are monuments of learning. He distinguished himself also as a Dante lecturer and biographer, and his *Amorosa Visione* testifies to Dante's influence. The *Decamerone* has caused Boccaccio's other narratives in prose and verse to be forgotten save by the student, and this collection of one hundred prose tales marks the highest achievement in its way than the knowledge of human nature and the humanity displayed, and the book served as a source from which great writers of every nation borrowed their plots.

The period produced numerous imitators of the three great Tuscans, and these aimed at pleasing the people rather than the learned. The lyricists are scarcely worthy of mention. Boccaccio had a distinguished disciple in Franco Sacchetti (c. 1330-1400). Popular, too, were the didactic efforts of Jacopo Passavanti (1300-59) and S. Catherine of Siena (1347-80). In the first half of the 15th century, again, while the large majority of the humanists, men of the greatest gifts, were carrying on the classical tradition in Latin works which cannot be dealt with here, some of them realized the importance of introducing something of the manner and matter of the ancients to the people by speaking to them in their own tongue. Foremost among these were that universal genius Leon Battista Alberti (1407-72), with his *Della Famiglia*, and Matteo Palmieri (1406-75), with his *Della Vita Civile*.

Among the people themselves, of course, the popular aspects of literature were never neglected. The Florentine Domenico di Giovanni, called 'Il Burchiello' (1404-48), wrote

a number of *so icetti caudati* of a jocose and burlesque description, dealing with contemporary matters. The wandering *improvisatore* Niccolo, the 'blind man of Aiezzo' (d. 1440), and Antonio di Meglio (1384-1448) belong to the same class. The artificial love poetry assumed a more popular character in the songs of Lionardo Giustiniani (1388-1446), and the French epics, which had long been sung in the public squares by mountebanks, were written down by Andrea Magnabotti of Barberino in a prose version which is still popular.

The priests naturally opposed the humanists for preferring the classics to Holy Writ and the holy legends, and Giovanni Dominici (1356-1419) led the attack. Finally, there were several writers of tales who carried on the tradition of Boccaccio. And now we come to the glorious period of the Renaissance (roughly from 1450-1580). In Florence, at the court of the Medici, the Neo-Platonic ideas had found a home since the days of Cosimo, who had encouraged Marsilio Ficino (1433-39) to study this philosophy. Cosimo's grandson Lorenzo (1449-92), who ruled from 1469, developed the movement, and in the 'seventies the Platonic Academy was founded, the two greatest members of which, Ficino and Pico della Mirandola (1463-94), adapted Plato and Aristotle to current ideas. Lorenzo himself was no mean poet. Poliziano (1454-94), whose genius was fostered by Lorenzo, was a classical scholar of brilliant attainments. He wrote much beautiful poetry, both in Latin and Italian. The legend of *Orfeo*, treated in the form of a *rappresentazione*, and the *Stanze per la Giostra* are among the gems of Italian literature. Another of Lorenzo's protégés was Luigi Pulci (1432-84), whose *Morgante Maggior*e celebrates the deeds of the French epics in *ottava rima*. In many ways he breathes the spirit of his predecessors, the mountebanks, especially in the simplicity and directness of his manner, his greatest distinction is his humor. Again, it was Lorenzo who called to Florence the great Savonarola (1452-98). At the Neapolitan court there was a parallel movement. Giovanni Pontano (1426-1503), head of the Neapolitan Academy, wrote only in Latin, but no one since the classical period has handled it with greater beauty of style. His friend Jacopo Sannazaro (1458-1530) composed in Italian as well as in Latin. His *Arcadia* (c. 1481) became the model of all the later pastoral romances. In the north this tendency to uninspired Petrarchism was even more marked (Bellincioni, etc.). The only great northern poet of this early Renaissance

period was Bojardo (1434-94), whose *Orlando Innamorato* treats the same themes as Pulci's poem, in a totally different spirit. The courtly manner, the Breton mystic element, and classical features are woven into the original groundwork, with the result that we have here the first romantic epic.

The second or classical period of the Renaissance is distinguished, by one national, classical, literary tongue. We may pass over the theoretical aspect of this question and the struggle between the purists headed by Bembo (who maintained Florentine of the 14th century to be the one literary tongue) and those who favored the introduction of forms from other dialects. Suffice it to say that the former triumphed. Ariosto (1474-1532), if compared with Bojardo, marks this change most completely. He is superior to his predecessor (whose theme he continues) in imagination, and he breathes more fully the spirit of the Renaissance, but it may be doubted whether these qualities would have helped the *Orlando Furioso* to triumph through the ages if it had not been for the absolute perfection of its manner. Ariosto's other works—the comedies, lyrics, and satires—would have sufficed for a smaller reputation. Niccolò Machiavelli (1469-1527) is the exponent of the statesmanship of his age, and has sometimes been wrongly held responsible for advocating a state of things he was merely describing. His works of this class are based on a close and penetrating study of Roman antiquity and of his own age. Among his minor works the *Mandragola* is one of the most brilliant comedies of the time. Francesco Guicciardini (1483-1540) wrote dispassionate and masterly histories of Florence and Italy. The notorious Pietro Aretino (1492-1536) represents the age in its utter lack of moral consciousness, no less than in its wonderfully developed æsthetic sense. The former element is displayed in his comedies and dialogues, the latter in his tragedy of *Oracio*, while both qualities are conspicuous in the valuable collection of letters Cardinal Pietro Bembo (1470-1547) may be reckoned one of the most eminent Petrarchists in an age which numbered among its lyric poets writers of the stamp of Guicciardini, Molza, Caro, Della Casa, Alamanni, Vittoria Colonna, and—greatest and deepest of all—Torquato Tasso and Michelangelo. In prose the classical theories are best represented by the letters of Aretino, Bembo and Caro, and by two masterly treatises on manners in dialogue form—the *Cortegiano* of Baldassare Castiglione (1478-1529) and the *Galateo* of

Giovanni della Casa (1503-56). The forms of the ancients were again held up as models. Trissino introduced blank verse into his tragedy of *Sofonisba* (1515), while Giraldi (1504-73) imitated Seneca. Virgil's *Georgics* served as a model for didactic poems like the *Api* of Rucellai and the *Coltivazione* of Alamanni, while Ercole Bentivoglio imitated Horatian satire. The comedy of Terence and Plautus, mingled in various degrees with local color, was cultivated in the plays of Ariosto, Machiavelli, and Aretino. Another important representative of the school was Bernardo Dovizi of Bibbiena (1470-1520), with his *Calandria*, which was acted in 1513. Popular in character were the farces of Tuscany (such as those acted by the *Campagna de' Pazzi* of Siena), while the *commedia dell'arte* of North Italy, which dates from about 1550, was largely a matter of improvisation round a fixed *scenario*. Its characters—the *pantalone*, *arlecchino*, *pulcinello*, etc.—have become European types. Classical and popular elements appear in the serious short tales (the *Hecatommithi*) of Matteo Bandello (1490-1560). The fascinating autobiography of Benvenuto Cellini (1500-71) almost belongs here, so largely is it composed of truth and fiction. This great period is closed by the tragic figure of Torquato Tasso (1544-95), who endeavored, in his *Gerusalemme Liberata*, to voice a deep and sincere religious feeling. Nothing can detract from the beauty and passion of the episodes and characters of this great poem, while the pastoral play *Aminta* remains unsurpassed—even by the *Pastor Fido* of Guarini (1538-1612), and by Fletcher's *Painful Shepherdess*.

The primary causes of the long period of decline into which Italian literature now fell (1580-1750) were three—the counter-reformation, the political supremacy of Spain in Italy, and the petrifying influence of the Accademia della Crusca (founded at Florence in 1582). One of the first signs of decadence was the rapid and bombastic style of poetry called *Marinismo*, after Giambattista Marino (1569-1625). The classical lyrical tendencies of Chiabrera (1552-1638) and Testi (1593-1646) constituted a wholesome reaction, but were powerless to improve the general taste. The *commedia dell'arte* supplanted the regular drama more and more. That the prose of this period was not free from bombast is shown by the enormously popular pastoral novels which were imitated from Spanish and French models. At the same time, a more select and discriminating public was addressed by speculative writers, such as Giordano Bruno (1548-

1600) and Campanella (1568-1639), and, above all, by the great founder of the empirical method in natural science, and of modern scientific prose—Galileo Galilei (1564-1642). We may take the year 1642 as forming the end of the first period of decadence, the second being characterized by various attempts at reform. Literary academies—the multiplication of which is always a mark of decline—developed from the Neo-Platonic institutions of the 16th century. The second Arcadian period shows signs of improvement in the poems of *Crudeli* (1703-45) and Rolli (1687-1765), but especially in the brilliant melodramas of Pietro Metastasio (1698-1782), written as opera and oratorio texts. These reveal real dramatic instinct, and considerable powers of invention and characterization, while the style is poetical and free from exaggeration. The third period is most favorably represented by the dignified productions of Frugoni (1692-1768), who excelled in unrhymed *endecasillabi*. Prose was handled with distinction by several scholars—by Vico (1668-1744), who may be regarded as the founder of the philosophy of history, by Apostolo Zeno (1669-1750), who wrote excellent literary criticism, by Mazzuchelli (1707-68), whose *Scrittori d'Italia* forms the first great series of biographies, and by Muratori, whose collections of early historical documents testify to wonderful industry and scholarship.

The age of revival, known as the *Risorgimento* occupies about a hundred years (1750-1850). It had been prepared by men like Machiavelli, Bruno, Galilei, and Vico, and now additional impetus was forthcoming from England and France. The academies were supplanted by reviews on the English model, such as the *Osservatore* (1761) of Gaspare Gozzi (1713-86) and the *Frusta Letteraria* (1763) of Giuseppe Baretti (1719-89). Giuseppe Parini (1729-99) produced a satire of permanent value in his *Il Giorno*. Carlo Goldoni (1707-93) made a courageous attempt to supplant the *commedia dell'arte* by his comedies, admirably sincere pictures of the Venetian life he knew so well. The twenty-two tragedies of Vittorio Alfieri (1749-1803) represent an earnest endeavor to found a national Italian drama.

In prose the historical works of Carlo Botta (1766-1837) are remarkable both for style and for the national spirit they breathe. Indeed, this latter quality, no less than style, distinguishes much of the best work of the period. The Italian romantic movement was heralded by Cesarotti's translation of *Ossian* (1763) and by the Dantesque religious *Visions* of

Varano (1705-81). Milton, Young, Rousseau, and Klopstock were read and absorbed by men like Monti. Gaspare Gozzi's *Difesa di Dante* (1758) reawakened general enthusiasm for the great Florentine. Interest in the middle ages was restored (Muratori, etc.). The chief of the Italian romanticists, Alessandro Manzoni, was born in 1785 and died in 1873—thus outliving the movement, as Victor Hugo did in France. The *Inni Sacri* (1812-22) and the *Cinque Maggio* (1821) testify to great lyric gifts, while the *Conte di Carmagnola* and the *Adelchi* (1817-22) are powerful historical tragedies in the Shakespearean manner. Manzoni's masterpiece, the *Promessi Sposi*, first appeared in 1827, and was then republished, in a purer style, in 1840. Here Scott's is the dominating influence. The historical and personal threads are skilfully intertwined, and the masterly picture of Italy under the Spanish yoke in the 17th century did more than any other work to awaken the sense of liberty and the desire for a united Italy. The romantic drama, which like the novel was often political in aim, was most successfully cultivated by Giambattista Niccolini. The political aspirations of the age were most directly expressed by Gino Capponi (1792-1876), Cesare Balbo (1789-1853), and Vincenzo Gioberti (1792-1876). The works of Rosmini-Serbaty (1797-1855) are indispensable to the student of the philosophy, religion, and politics of the time. Italy's greatest lyrical poet since the 14th century appeared in Giacomo Leopardi (1798-1837), whose perfect manner is based on a profound study of the classics.

The transition to the modern period is marked by the patriotic poems of Francesco dall' Ongaro (1808-73), Domenico Carbone (1823-83), and Luigi Mercatini (1821-72). The romantic spirit with classical elements is found in the poems of Giovanni Prati (1815-84). The banner of revolt against romanticism was raised by Italy's greatest contemporary poet, Giosuè Carducci (b. 1836), whose grand classical manner has gone on growing in strength ever since the *Juvenilia* appeared in 1857. His foremost disciple is perhaps Giovanni Pascoli (b. 1855). The muse of Olindo Guerrini, known as Lorenzo Stecchetti (b. 1845), shows French influence, and is more sensuous. Ada Negri (b. 1870) utters the socialistic cry of the age. Other lyricists of eminence are Domenico Gnoli (b. 1836), Arturo Graf (b. 1848), and Enrico Panzacchi (1841-1904). The drama gradually became realistic though Pietro Cossa (1830-81) is still frankly historical, while Paolo Ferrari (1822-89) is at

his best in dramatizing episodes of literary history. Giuseppe Giacoso (b 1847) and Gerolamo Rovetta (b 1854) represent the modern tendencies in drama, while in comedy the distinguished names are Gherardi del Testo (1818-81), Ferdinando Martini (b 1841), and Vittorio Bersezio (1830-1900). Among the novelists, Barrili (b 1836) and Salvatore Farina (b 1846) are comparatively untouched by the realistic movement. But Giovanni Verga (b 1840) with his Sicilian peasant tales, led the way in realism. Antonio Fogazzaro (b 1842) reveals much earnest talent in his novels, which mingle realism with romantic and Catholic aspirations. Matilde Serao (b 1856) has many admirable qualities to atone for defects due to a journalistic training. Edmondo de Amicis (b 1846) deserves mention for his voluminous writings (tales, sketches, travels, etc.), which are perhaps the most popular in Italy, and are distinguished by a real sense of style. The country is rich in scholars like Carducci, D'Ancona, De Sanctis, Ascoli, Graf, Villari, Comparetti (to name but a few), whose contributions to science (philology, history, etc.), often attain the level of literature. Gabriele D'Annunzio (b 1863), alike as a lyrical and narrative poet, as a writer for the stage, and as a novelist, has produced remarkable work. It contains the most varied elements—realistic, classical, romantic, symbolical—and is based on a wide study of literature, Italian and foreign. Luigi Pirandello (b 1867), playwright and novelist, was awarded the Nobel Prize for Literature in 1934.

English readers should study J. A. Symonds's *Italian Renaissance* (7 vols. 1875-86), especially the volumes on the literature, and Garnett's *Short History of Italian Literature* (1898).

**Itata Affair**, an affair growing out of the seizure (1891) at Iquique by the U. S. cruiser *Charleston* of the *Itata*, a transport in which Chilean insurrectionists against Balmaceda were carrying to Chile arms and munitions of war obtained in the United States. The matter came before the U. S. District Court at San Diego, Cal., which decided that the *Itata* was engaged in legal commerce and had not violated the neutrality laws of the U. S.

**Itch, or Scabies**, is a highly contagious skin disease, caused by a minute parasite, the *Acarus* (or *Sarcoptes*) *scabiei*, which burrows and deposits eggs beneath the human skin. It is communicated from one patient to another, and is most common among neglected

and unwashed children. The *Sarcoptes scabiei* is often wrongly called the itch 'insect'; it is really a mite, and belongs to the zoological class Arachnida.

**Ithaca** (1) Now Thaki, one of the Ionian Islands, off the coast of Epirus (Turkey), immediately e. of Cephalonia. It is famous as having been the home of Odysseus. (2) City, New York, co. seat of Tompkins co., at the head of Cayuga Lake. Ithaca is the seat of Cornell University. Other educational institutions are the State Veterinary College, State Agricultural College, and the Ithaca Conservatory of Music. The chief manufactures are guns, clocks, farm implements, iron castings, paper. Ithaca is a shipping point for agricultural and dairy products, p. 19,730.

**Ithome**, mountain in Messenia, in ancient Greece, on which stood the chief fortress of the Messenians.

**Itinerary**, the Roman name for a written or pictured description of all the roads (*itineraria*) in the Roman world.

**Ito, Prince Hirobumi** (1838-1900), Japanese statesman. When a young man of about twenty-six, he was one of a small band of spirited young Japanese who went to Europe to gain some personal knowledge of Western nations. After his return from England, the overthrow of the Tycoon government was followed by a social and political revolution in which Ito played a conspicuous part. In 1878 he became president of the Cabinet and minister of home affairs, practically controlling the government. Banished to Manchuria, he was assassinated in Harbin. He composed the Japanese constitution and was perhaps the dominant figure in the modernization of Japan.

**Iturbi, José**, (1895- ) famous Spanish pianist, who received ovations in America especially after recitals with the Philharmonic Society in New York. He toured the United States in piano concerts several times, and in 1933, after a successful season in Mexico, appeared in the East as an orchestral director, returning to direct various orchestras, including the New York Philharmonic. He appeared as a pianist in many motion pictures.

**Iturbide, Agustín de** (1783-1824), a Mexican revolutionary leader and emperor. Early in 1821 he became the head of a movement to make Mexico a virtually independent monarchy under the rule of a Spanish Bourbon, and, this plan failing, he was himself emperor from 1822 to 1823. Santa Anna and Guerrero, who favored a republic, forced his

resignation. He went to Europe and was forbidden to return, but reappeared in 1824, and was promptly arrested and executed at Padilla January 19th.

**Ivan**, the name of several rulers of Russia. **IVAN I** succeeded Alexander II in 1328, and



Prince Ito

(Photo by W & D Downey)

took the title of Grand duke of Moscow, he afterwards entered a monastery, where he died in 1350—**IVAN III** (Vassilievitch), or **IVAN THE GREAT** (1440-1505), succeeded his father in 1462, and delivered his people from the Taitar dominion. **IVAN IV** (Vassilievitch), known as **IVAN THE TERRIBLE** (1530-84), ruled from 1533, and was the first to adopt definitely the title of Czar, a vigorous reformer both of justice and commerce, but became cruel in his later years. He curbed the power of the nobles, and in 1553 concluded a commercial treaty with Queen Elizabeth of England—**IVAN VI** succeeded his aunt, the Empress Anna, in 1740, at the age of three months, but was deposed and put to death in prison in 1764.

**Iveagh, Lord** (1847-1927), better known as Sir Edward Cecil Guinness, at one time head of the great firm of brewers of that name in Dublin. He gave much money towards improving health and housing in Dublin, and for bacteriological research, especially known for the funds he donated to

Jenner Institute of Preventive Medicine, London, in 1898.

**Ives, Frederic Eugene** (1856-1937), American inventor, devoting his attention to the problem of color photography.

**Iviza**, or **Ibiza**. One of the Balearic Isles, Spain, 60 m sw of Majorca, p 23,648. The principal wealth is derived from lead mines. Salt is obtained by evaporation. There are two good harbors, Iviza and Puerto Magno.

**Ivory**, the material (a variety of dentine) of the tusks of elephants. These teeth grow to a great size, single specimens sometimes weighing over two hundred and fifty pounds, and continue to grow as long as the animal lives. The word ivory is also applied less strictly to similar substances obtained from the hippopotamus, narwhal, walrus, etc. The best ivory comes from equatorial Africa, and Antwerp is now the chief market. The uni-



Carved Ivory

Part of diptych Roman 4th century

formity and fineness of the texture of ivory, its mellow tints and delicate translucency, its very perfect elasticity, and the readiness with which it adapts itself to the carver's art, are among the many valuable qualities that have for ages given it its unique position as a ma-

terial for handles, toilet articles, instruments, billiard-balls, ornaments, and carvings. Many attempts have been made to find a satisfactory substitute for ivory, but with only partial success. Celluloid, though a material in some respects even superior to ivory, serves but a limited purpose.

**Ivory**, Sir James (1765-1842), Scottish mathematician. 'Ivory's theorem' (read before the Royal Society in 1809) is a resolution of the problem of attractions of ellipsoids.

**Ivory Coast**, French colony on the west coast of Africa, between the republic of Liberia and the British colony of the Gold Coast. The interior, a table-land, is clad with almost impassable forest, interspersed with stretches of savanna. The chief products are maize, rice, coffee, palm oil and kernels, india-rubber, mahogany, ivory, and gold dust. The coast was first settled in 1843.

**Ivrea**, tn and episc see, prov Turin, Italy. A Roman bridge crosses the river, another interesting structure is the castle. Strategically important in Roman times, the town was the capital of the margraviate of Ivrea established by Charlemagne.

**Ivy** (*Hedera*), a genus of climbing shrubs known and valued over a great part of the world. The common ivy (*Hedera helix*), conspicuous in European gardens, on walls and ruins, etc., is not hardy without protection in the northern United States. It belongs to the order Araliaceae. Propagation is usually effected by means of cuttings. Popular as a house plant, it needs regular water and washing of the leaves. Poison Ivy has three leaflets not palmately arranged on a common stalk, irritates the skin in a violent manner.

**Ixion**, in ancient Greek legend, was a king of the Lapithae, in Thessaly. For attempting the virtue of Hera he was bound in hell to an ever-rolling wheel.

**Ixmiquilpan**, tn, Hidalgo, Mexico, center of silver mines, 80 m from City of Mexico, p c 15,000.

**Ixtlilxôchitl**, Don Fernando de Alva (c 1570-?1648), was a descendant of the ancient Chichimecs, or the clan or tribe of Tezcuco, and wrote historical works of great value concerning the native Mexicans and the relations between them and the Spanish after the conquest.

**Izard**, the name of a local race of the chamois (*Rupicapra tragus*) which is confined to the Pyrenees.

**Izard**, George (1776-1828), American soldier, was an aide to Gen Alexander Hamilton. He was the second Territorial governor of Arkansas (1825-8). He published *Official Correspondence with the War Department* in 1814 and 1815 (1816).

**Izard**, Ralph (1742-1804), American political leader and diplomat. He was educated at Cambridge University, Eng., nominally the American representative at the Court of Tuscany (1776-9), he remained at Paris, and as a friend of Arthur Lee became embroiled in the contentions of the American representatives there. He was afterwards a member of the Continental Congress (1782-3) and of the U S Senate (1789-95) of which he was president *pro tempore* from May, 1794 until Feb 1795. A volume of his *Correspondence* 1774-1804 was published in 1844.

**Izu-no-schichi-to**, the seven islands of Izu, Japan, stretching some 100 m s of Tokyo Bay. The largest, Vries I, or Izu-no-Oshima, has an active volcano, Mihara (2,500 ft). Formerly convict settlements.

**Izvol'ski**, Alexander Petrovich, Baron, (1856-1919), Russian diplomat and statesman, he was charge d'affairs and later minister at the Vatican, then successively minister to Japan and Denmark, became assistant minister of foreign affairs in 1905, and succeeded Count Lamsdorff as full minister in 1906. In 1908 he represented Russia in the international negotiations for the settlement of the Balkan troubles without war. His father was rector of the Univ of St Petersburg.



# J

J

Jackson

**J** is simply a modification of **I**. It was employed for a time as the initial form of that letter. Since the 17th century the consonantal value of *j* has been assigned to *j*, and its vocalic value to the older form. The value of German *j* is the early consonantal value of *i*, it occurs also in the English word 'hallelujah'. In Spanish *j* has a sound somewhat resembling that of the German *ch*. The present English value is a compound of *d* and *sh*, it was borrowed from the French in the 14th century. The French value has now become *zh*, as in 'jour'. See **I** and **G**.

**Jabalpur**, or **Jubbulpore**, cap of Jabalpur dist., Central Province, India, manufactures cottons and carpets. Formerly it was notorious as the haunt of the Thugs, p. 108, 793.

**Jabbok**, riv., E. Palestine, rises in Jebel Hauran, and flows in a winding course s w and w into the Jordan.

**Jabesh-Gilead**, tn of Gilead, Palestine, in Manasseh. Its inhabitants were put to the sword because they refused to help Israel against the Benjamites.

**Jabiru**, a storklike bird of the genus *Mycteria*. The American jabiru (*M. americana*) is white, with black head, neck and bill, and feet. Both head and neck are devoid of feathers.

**Jaborandi**, a name given in pharmacy to the dried leaflets of *Pilocarpus jaborandi* and other Brazilian species of this genus of shrubs, which belongs to the natural order Rutaceae. Jaborandi contains tannic acid, a volatile oil, and the alkaloids pilocarpine and jaborine.

**Jacamars** are brilliantly-colored South American birds of the family Galbulidae, and are allied to the barbets and honeyguides.

**Jacana**, a name given to the members of the family Parridae, widely distributed limicolin birds, remarkable for the great length of their toes, especially the posterior toe or hallux.

**Jacaranda**, a genus of American trees and shrubs, chiefly Brazilian, belonging to the order Bignoniaceae. They are sometimes cultivated in greenhouses for their beautiful

bipinnate foliage and their terminal panicles of blue flowers.

**Jacaré**, any of the narrow-snouted tropical American alligators or 'caimans,' especially *Caiman sclerops*.

**Jackal**. The common jackal (*Canis aureus*) of Asia generally, and of N. Africa, is an animal between two and two and a half feet long, with a bushy tail one-third of the length of the head and body. The jackal varies greatly in color in the different parts of its extensive range, but is generally light red-



Jackal

dish brown, with a black tip to the tail. It interbreeds freely with the pariah dogs of India and Egypt, and differs from the wolves chiefly in the smaller size. The diet is varied, the flesh of animals which the jackals have themselves killed being mingled with carrion, fruits, seeds, and sugar-cane, of which they are very fond. They live in burrows and dens among rocks, and are chiefly nocturnal, going about in small companies and uttering a most unpleasant howl.

**Jackdaw** (*Corvus monedula*), a member of the crow family, found throughout most of Europe, Western Asia, and Northern Africa. It is a noisy gregarious bird, about fourteen inches long, with glossy black plumage. It is shrewd, intelligent, and easily tamed, often making an amusing pet.

**Jack-in-the-Pulpit** (*Arisaema triphyllum*), a familiar, araceous plant, found in marshy woods and thickets in the Eastern United States. It has two three-lobed leaves, and between them a single flower, with a long acuminate spathe, arching over the spadix, not unlike a sounding board.

**Jackson**, city, Michigan, county seat of

Jackson co Features of interest are the Michigan State Prison, and Sharp Park The chief manufactures are furniture, automobiles, candy, underwear Near by are several coal mines, p 49,656

**Jackson**, city, capital of Mississippi, county seat of Hinds co, on Pearl River The City is situated in a rich cotton-growing region It has a Confederate monument and a statue of Jefferson Davis, p 62,107



*Jackdaw*

**Jackson**, city, Ohio, county seat of Jackson co It is the center of a coal and iron mining district It was settled about 1818 The district is noted for prehistoric remains, p 6,295

**Jackson**, city, Tennessee, county seat of Madison co It is the center of a large cotton trade, and in the vicinity vegetables and fruit, strawberries especially, are cultivated The chief manufactures are engines, boilers, machinery Jackson was settled in 1822 and was the scene of several skirmishes in the Civil War, p 24,332

**Jackson**, Abraham Valentine Williams (1862-1937), American Oriental scholar, instructor and adjunct professor in Anglo-Saxon and the Iranian languages until his appointment (1895) as full professor of Indo-Iranian languages in Columbia University He travelled extensively for research in India, Persia, and Central Asia He published *Persia, Past and Present* (1906), *Early Persian Poetry* (1920) and other works on Oriental linguistics

**Jackson**, Andrew (1767-1845), seventh president of the United States, was born on March 15, 1767, of Scotch-Irish parents, who had emigrated from Carrickfergus, Ireland, to America in 1765 His actual birthplace is somewhat in doubt His father died a few days before the son's birth, and the latter was forced from childhood to struggle with poverty and hardship In 1784 he began the study of the law at Salisbury, N C, and in

1788, he was admitted to the bar Almost immediately he became public prosecutor of Eastern Tennessee, still a part of North Carolina, and made his home at Nashville, then almost a backwoods settlement

In 1790 he married Mrs Rachel Robards, both believing at the time that she had been legally divorced from her first husband, Lewis Robards, the divorce, however, was not really consummated until 1793, and the marriage ceremony was repeated in January, 1794 The peculiar circumstances of the marriage were subsequently made the basis for attacks which gave rise to some of Jackson's bitterest enemies Jackson was a member of the convention which framed the first constitution of Tennessee, and was the first representative of the State in Congress (1796-7) He was a member of the U S Senate (1797-8), was a justice of the Supreme Court of Tennessee (1798-1804), and then for nine years engaged in trade and planting In the War of 1812 he gained a national reputation and became a popular hero He became a major-general of regulars in the U S Army, May 1, 1814, and without orders from the War Department assumed the responsibility of seizing Pensacola, Fla, whose Spanish commanding officer had befriended and helped the British After the treaty of peace between the United States and Great Britain had been concluded (Dec 24, 1814), but before the news had reached him, Jackson thoroughly defeated a superior force of seasoned English veterans under Sir Edward Pakenham, who had assaulted his position at New Orleans (Jan 8, 1815) Jackson remained in the military service until 1821, negotiated several important treaties with the Indians, and waged a successful war against the Seminoles For high-handed measures, Calhoun, then Secretary of War, advocated, in a secret cabinet meeting, his being formally censured, this long afterwards came to Jackson's ears and led to his breaking with Calhoun, an event of great significance in American political history Jackson was the first American governor of Florida (Mar 10-July 18, 1821), was a Democratic (Democratic-Republican) member of the United States Senate (1823-5), and in 1824, as a candidate for the presidency against J Q Adams, W H Crawford, and Henry Clay, received a plurality of the popular votes, and the largest number (99), but not a majority, of the electoral votes The election was thrown into the House of Representatives, and Adams was chosen but Jackson's popularity was such

that at the next election (1828) he was chosen President by an overwhelming majority. In 1831 he was re-elected, his principal opponent being Clay, thus serving from 1829 to 1837. His presidency was marked by his long and bitter fight against the second United States Bank, by his adoption on a large scale of the 'spoils system,' as applied to Federal office-holders, by his stand against nullification in South Carolina, by his firm and successful stand against the policy of internal improvements, by his free use of the veto power, and by his securing from France the promise to pay the large spoliation claims long due American citizens. To an especial degree, too, it was a period of personal politics.

President Jackson was greatly influenced by a coterie of advisers outside his cabinet, generally known as his 'kitchen cabinet.' During Jackson's presidency the division in the Democratic-Republican party was consummated and two parties arose—the followers of Jackson, or Democrats, and their opponents, the National Republicans. Consult *Bassett's Life* (1911).

**Jackson, Charles** (1775-1855), American jurist, was judge of the Massachusetts Supreme Court. In 1833 he had a part in revising the State constitution. His *Treatise on the Pleadings and Practice in Real Actions* (1828) is standard.

**Jackson, Charles Thomas** (1805-80), American scientist. He claimed that the credit for the telegraph belonged to him, rather than to Morse, and also that he had discovered ether as an anæsthetic. A committee from the French Academy of Sciences decided that both Morton and Jackson should be recognized. He drew the plan for the geological survey of New York and discovered copper mines near Lake Superior. He wrote a *Manual of Etherization, with a History of Its Discovery* (1863).

**Jackson, Frederick George** (1860-1912), English Arctic explorer, was the leader of the Jackson-Harmsworth Polar Expedition to Franz Josef Land, where he made valuable scientific discoveries and observations. He is the author of *The Great Frozen Land* (1895) and *A Thousand Days in the Arctic* (1899).

**Jackson, Helen Fiske Hunt** (1831-85), American poet and novelist, best known by her pen name, 'H. H.' Her works include two volumes of poems, *Ramona* (1884) is probably her best-known work.

**Jackson, Henry Rootes** (1820-98), American soldier. He was colonel of Georgia

troops in the Mexican War, and was U. S. *chargé d'affaires* (1853) and minister resident in Austria (1854-8). From 1885 to 1886 he was U. S. minister to Mexico. He published *Tallulah and Other Poems* (1851).

**Jackson, Howell Edmunds** (1832-95), American jurist and legislator, was U. S. Senator from Tennessee in 1881-6. He was appointed circuit judge for the sixth district in 1886 and associate justice of the U. S. Supreme Court (1893).

**Jackson, James** (1757-1806), American soldier and political leader. He was a member of the first constitutional convention of Georgia, was a representative in the first Congress of the United States after the adoption of the Constitution (1789-91), was a U. S. Senator (1793-5, 1801-6), and was governor of Georgia (1798-1801). He is perhaps best remembered for his opposition in the lower house of the Georgia legislature (1796) to the 'Yazoo Frauds.'

**Jackson, James Streshly** (1823-62), American soldier. He entered Congress in 1860, resigned in December 1861, and raised a regiment of Kentucky cavalry in which he served as colonel. He was killed at the battle of Perryville, in October 1862.

**Jackson, John Adams** (1825-79), American sculptor. After 1860 he lived in Italy. Noteworthy sculptures are *Eve and the Dead Abel*, *Soldiers' Monument* at Lynn, Mass.

**Jackson, Robert Houghwout** (1892- ), American lawyer. He was born at Spring Creek, Pa., educated at Albany Law School, practiced law in Jamestown, N. Y. He became general counsel for the U. S. Bureau of Internal Revenue, 1934, assistant attorney general, 1936, solicitor general of the U. S. in 1938, Supreme Court justice, 1941- ) Presided over Nuremberg War Trials (1946).

**Jackson, Sheldon** (1834-1909), American missionary to the Indians, was born at Minerva, N. Y. He was engaged in missionary work among the Indians of the West and Southwest. In 1885 he became U. S. general agent of education in Alaska.

**Jackson, Thomas Jonathan** (1824-63), known as 'Stonewall' Jackson. He was born on Jan. 21, 1824, in Clarksburg, Va. (now W. Va.), was graduated with little distinction from West Point in 1846, and as a lieutenant served in the southern campaign of the Mexican War (1846-7). In March 1851 he resigned from the army, and until the outbreak of the Civil War was professor of natural and experimental philosophy and artillery

tactics at the Lexington Military Institute, making a visit to Europe meanwhile. He deprecated secession, but was a strong believer in States' rights, and when Virginia withdrew from the Union maintained his allegiance to the State, and shortly afterward was commissioned a brigadier-general in the Confederate service. He showed his dogged intrepidity in the first battle of Bull Run (July 21, 1861), arriving with Johnston's troops from Harper's Ferry in time to help materially toward changing the fortunes of the day. For his gallant conduct he was commissioned and served in the Shenandoah Valley.

Under Lee's orders, he won the second battle of Bull Run (Aug. 29-30) and by a forced march rejoined Lee in time to participate in the battle of Antietam (Sept. 16-17). He commanded the Confederate right at Fredericksburg (Dec. 13), was promoted to the rank of lieutenant-general, and at Chancellorsville, after making a famous flanking march directed against Hooker's right, was severely wounded in the left arm (May 2, 1863) by his own men while making a reconnaissance. After the amputation of his arm, pneumonia developed, and he died May 10, 1863. Consult Henderson's *Stonewall Jackson and the American Civil War*.

**Jacksonville**, city, Florida, county seat of Duval co. It has many splendid public buildings, among which are the city hall, and Confederate Veterans' Home. There is excellent bathing near by. It is famous as a winter resort and for fishing. The city has several beautiful parks. Jacksonville is the commercial center of the State and there is a brisk trade with New York, Charleston, and other Atlantic ports. Manufactures and agricultural products of all varieties are shipped, including oranges and other citrus fruits and vegetables in large quantities, hides, moss. The lumber industry is important. Vast naval stores are manufactured and there are phosphate plants—beside cigar factories, fisheries and canning plants.

Jacksonville was settled in 1816, and was named after General Andrew Jackson, p. 173,065.

**Jacksonville**, city, Illinois, county seat of Morgan co., is less a manufacturing than a residential city, and has numerous educational and philanthropic institutions, population 19,844.

**Jacmel**, or **Jacquemel**, seaport, republic of Haiti, on the south coast, 30 m. s.w. of Port-au-Prince. It is a seaport with a good

anchorage, and exports cotton, cotton seeds, coffee, and logwood, p. 12,000.

**Jacob**, one of the Hebrew patriarchs, was the son of Isaac and grandson of Abraham. His life, as picturesquely narrated in Genesis, is a strange blend of selfishness and duplicity on the one hand, and of heroism and spiritual aspiration on the other. Through his twelve sons he became the ancestor of the Israelitic nation. Consult *Isaac and Jacob* (Men of the Bible) by Rawlinson.

**Jacobi**, **Abraham** (1830-1919), German-American physician, was born in Hartum, Westphalia, and was educated at the universities of Greifswald, Göttingen and Bonn. For complicity in the revolutionary agitation he was convicted of treason and imprisoned at Minden and Bielefeld from 1851 to 1853, when he came to the United States. In 1860 he was chosen to fill the first chair of diseases of children instituted in the United States, that of the New York Medical College, he remained there until 1865 and from 1865 to 1870 held the same position at the University of the City of New York, and afterwards at the College of Physicians and Surgeons.

**Jacobi**, **Friedrich Heinrich** (1743-1819), a younger contemporary of Kant, and himself a philosopher, was born at Dusseldorf. Here he held intercourse with a wide circle of literary friends, among whom were Lessing, Herder, and Goethe. He did much to direct attention to the true importance and significance of Spinoza, and also distinguished himself by acute criticism of Kant. He represents an important tendency in the thought of the period—*viz.* that which recognized faith rather than demonstrative science as ultimate, and insisted on the limits of the knowledge attainable by the latter.

**Jacobi**, **Mary Putnam** (1842-1906), American physician, wife of Abraham Jacobi, was born in London, England, a daughter of G. P. Putnam, the New York publisher. She studied at the Philadelphia Woman's Medical College and at the New York College of Pharmacy, and was the first woman to be enrolled as a student at the Ecole de Médecine, Paris, where she was graduated in 1871. She was also the first woman to be admitted to the New York Academy of Medicine. She was dispensary physician at the Mt. Sinai Hospital, New York city, for twelve years, professor in the Woman's Medical College of the New York Infirmary for ten years, and for three years was a member of the faculty of the New York Post-Graduate School.

**Jacobins**, a party that appeared in France during the Revolution. At first fairly moderate in tone, and including all deputies opposed to the government, after 1791 it became more extreme and decidedly revolutionary. During the years 1792-94 it was one of the most important influences in France, influencing opinion by means of daughter clubs in every considerable town and village throughout France. Camille Desmoulins, Marat, Danton, Pétion, and all the revolutionary leaders, were at one time members, but the dominant influence was that of Robespierre. On his fall the club was closed (1794).

**Jacobites**, the name applied after the revolution of 1688 to the adherents of the Stuarts, more particularly to those who rose in 1715 and 1745, or openly sympathized with them then or later. In 1715 occurred the simultaneous rebellions in Scotland and in the north of England. The indecisive battle of Sheriffmuir proved the end of the Scottish affair, and the English rebels surrendered at Preston. It is the rebellion of 1745, with the charming personality of the 'Young Pretender,' 'Bonnie Prince Charlie,' that has touched the heart of romance. The enterprise was really hopeless from the first, but many circumstances seemed to favor it. At first fortune smiled on Charles and his Highlanders, and Prestonpans seemed the earnest of still greater victories. But the turning at Derby showed the Stuart incapacity for seizing an opportunity, and, despite many gallant and romantic episodes, the remainder even of Prince Charlie's life was frivolous and inept. The vengeance taken by the English government was limited by the prudence of Forbes of Culloden, and the power of the Highland chiefs was broken by the abolition of heritable jurisdictions, and by the era of prosperity which set in as soon as the Highland menace was removed.

**Jacobs, William Wymark** (1863-1943), English author, was born in London. He wrote stories about the sea and the occult. Among his works are *Many Cargoes* (1896), *Deep Water* (1919), and *The Monkey's Paw*. Several plays were written in collaboration.

**Jacobus** (Latin equivalent for *James*), a gold piece which obtained its name from being introduced into the British coinage by James I. It was of the value of twenty-five shillings sterling.

**Jacobus, Melancthon Williams** (1816-76), American clergyman, was born at New-ark, N. J. and graduated (1834) at Prince-

ton. He entered the Presbyterian ministry and was pastor of the First Church, Brooklyn, 1839-51. He became professor of oriental and biblical literature at Allegheny Theological Seminary, 1851. His *Notes on the New Testament* (1848-59) were made use of by all Protestant denominations.

**Jacoby, Harold** (1865-1932), American astronomer, was born in New York city, and was educated at Columbia. He was assistant astronomer of the U. S. eclipse expedition to W. Africa in 1889-90, and was made professor of astronomy at Columbia in 1894. He has published *Practical Talks by an Astronomer* (1901), suited to the lay reader, and many technical papers.

**Jacopone da Todi** (c. 1240-1306), Italian religious poet, entered the Franciscan order, and wrote religious poems that breathe the most passionate asceticism. He is important chiefly as an author of *laude*, which, in their dialogue form, play a leading part in the development of the Italian drama.

**Jacquard, Joseph Marie** (1752-1834), French mechanician, born at Lyons, did much to improve the lot of the French artisan. He invented the Jacquard loom. This revolutionized the art of weaving.

**Jacquerie**, a revolt of French peasants in May and June, 1358. The name arose from the contemptuous term 'Jacques Bonhomme' by which the nobles designated the peasants. The nobles, headed by Charles of Navarre, utterly defeated the peasant army near Meaux.

**Jacquinia**, a genus of W. Indian and tropical American evergreen shrubs and trees belonging to the order Myrsinaceæ.

**Jactitation of Marriage**. An ancient common law offence which consists in a person's repeatedly falsely declaring in public that he or she is married to another person.

**Jadeite** is a mineral of the pyroxene group, which occurs in compact masses of thin felted fibres, very tough, hard, and taking a fine polish. It was formerly confounded with nephrite, a mineral of the amphibole group, the two species being included under the generic name of jade. White, pale-green, apple-green, and emerald-green varieties are known. It is found in China, Burma, and many parts of Southern Asia. In Mexico and China it was in great favor.

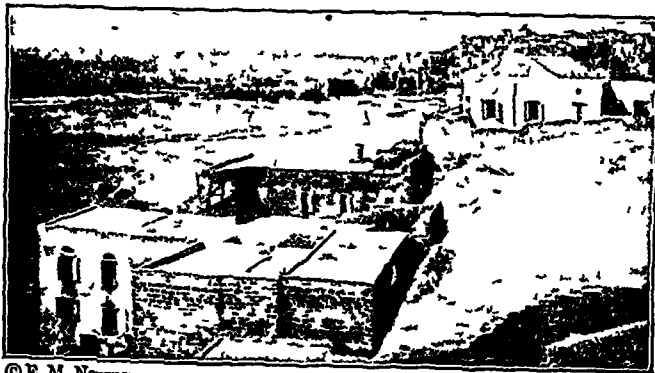
**Jaen**. Province, Southern Spain, on the slopes of Sierra Morena and the plains near Granada. It is well watered by the rivers Guadalquivir, Segura, etc., and is one of the most fertile districts in Spain, producing oil

wine, and cereals. Lead-mining is active. The capital is Jaen, Moorish ruins, and the cathedral on the site of a mosque, containing St. Veronica's handkerchief with the holy face, are specially interesting.

**Jaffa** (anc. *Joppa*), seaport of the Syrian coast. The chief exports are oranges, olive oil, sesame, wool, and barley, p. 47,710. It is the great pilgrim port for Palestine. It is noticed on monuments 1600-1300 B.C., and was attacked by Sennacherib in 702 B.C. It was sacked by the Arabs in 1722, and by Napoleon in 1799.

type of coloration—spots of black on a light ground, but while the leopard's spots are either pure black or consist of an incomplete ring of black surrounding a light spot, the jaguar bears large black rings, including one or more black spots on a light ground. The jaguar occurs from western Texas to Patagonia. Consult Porter, *Wild Beasts* (1894).

**Jahn, Otto** (1813-69), German archaeologist and philologist, born at Kiel. His *Die Hellenische Kunst* (1846) and *Petitho* (1846) are held to be of first importance, *Persius* (1843) and *Censorinus* (1845) have high val-



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The Port of Jaffa

**Jagellones**, a royal dynasty of Poland, descended from Gedimin, grand-duke of Lithuania, in the early part of the 14th century.

**Jaggary** is a sugar obtained from the flowering shoots of two Indian palms, *Phoenix sylvestris* and *Caryota urens*. But many other palms, notably *Nipa fruticans*, *Arenga saccharifera*, and the date palm, *Phoenix dactylifera*, also yield jaggary juice. This saccharine juice is largely fermented, and the fermented liquid distilled, a form of arrack being the product.



Jaguar

**Jaguar** (*Felis onca*), the largest of the New World cats. It slightly exceeds the Old World leopard in size, and possesses a similar

ue. Among his publications there is a masterly biography of Mozart (1856-60).

**Jahvist** (more correctly Yahwist), or J, a term applied to the writer or school from whom came those portions of the Hexateuch characterized by the use of the name Yahweh.

**Jainism** is the faith of a religious community in India, which, according to tradition, owes its origin to Vardhamana Mahavira (c. 550-480 B.C.). He was born in a suburb of Vaisali, the capital of Videha, the ruins of which lie at Besen in Tirhut, about twenty-five miles from Patna. One of the new ideas was to substitute for the sacrifice of animals to the gods the habit of self-sacrifice. Varhamana joined an order of ascetics whose main principles were non-injury and bodily self-sacrifice and self-torture. They believed in the existence of souls inside all living things, including men and the most minute vermin. The members of the order went naked, refrained from disturbing vermin, obtained food by begging, and strove in every way to suppress the body—so far, indeed, that it was considered a great merit to die by self-inflicted starvation. From the 3d to the 8th century they seem to have been

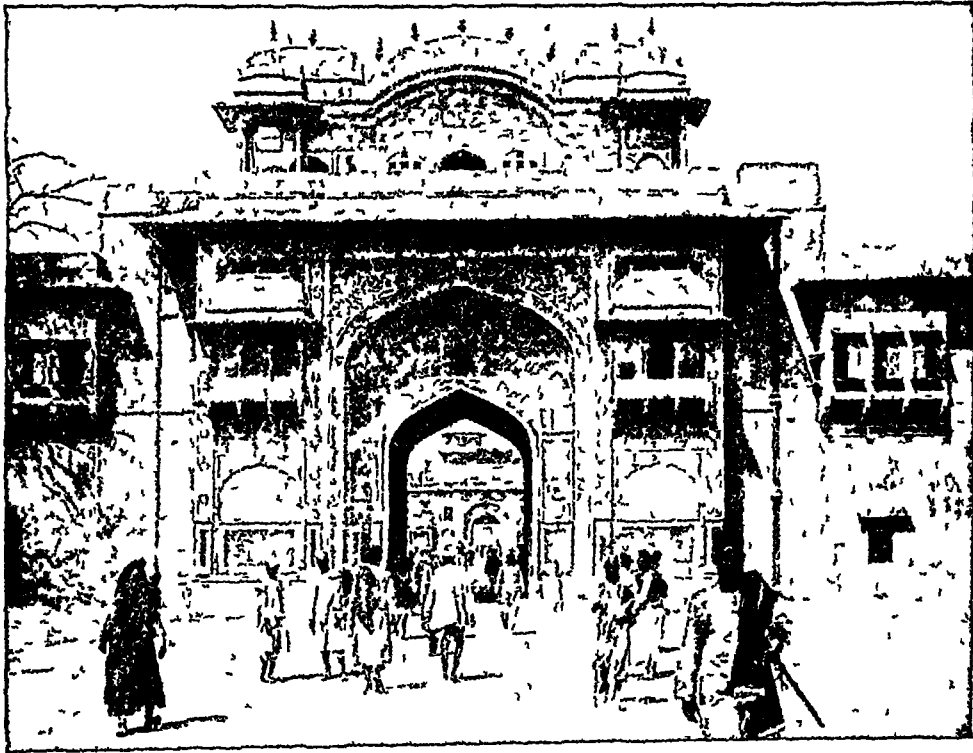
numerous and powerful, but they suffered persecution at the hands of the Brahmuns, and are now a small community. Many of the most beautiful of the mediæval buildings in India were built by the Jains, and their temples on Mount Abu and Mount Parasnath are famous. See Hopkin's *Religions of India* (1895).

**Jaintia Hills**, subdiv. of Khasi and Jaintia Hills dist., Assam, India. Coal and limestone are the chief minerals, and rice is grown. The inhabitants, who call themselves Panars, have a monosyllabic language differing from that

Pass, midway between Kabul and Peshawar. It was the scene of a magnificent defence against the Afghans for five months, in 1841-2, by a British force under Sir Robert Sale, p. about 3,000.

**Jalap** is a drug consisting of the dried tubers of *Ipomœa jalapa*. It increases the flow of bile.

**Jalapa**, Mexico, capital of the State of Vera Cruz, p. 27,623. It is known for its picturesque site, the slope of the Sierra rising behind it. It is interesting for its old Spanish buildings. A Franciscan convent was found-



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*Jaipur, India. Second Gate to Royal Palace*

of the Khasis, by whom they are called Syntengs.

**Jaipur**, or **Jeypore**. Feudatory state in Rajputana, India. Copper, cobalt, and iron are found, and salt is prepared. Gold enamelled work is the chief industry. Jaipur is one of the wealthiest and best administered states under native rule, p. 2,339,000. The capital, Jaipur, is one of the most striking of Oriental cities. The picturesque ruins of Amber, the ancient capital, are 5 m. distant, p. 120,207.

**Jalalabad**, or **Jelalabad**, tn. near the Kabul R., Afghanistan, near the Khyber

ed here in 1556, by Cortés. There are beautiful gardens, and a handsome cathedral.

**Jalisco**, state of Mexico, bounded on the w. by the Pacific Ocean. The n. is drained by the Rio Grande de Santrigo, which flows out of Lake Chapala. The state rises in terraces from the coast to the Sierra Madre, with its volcanic cones, the highest of which are Colima (12,750 ft.) and Nevado, now extinct (14,100 ft.). Gold and silver are mined, p. 1,220,000. Cap. Guadalajara.

**Jam**. Jams and fruit jellies consist respectively of the whole substance of fruits, or of their fluid portions only, preserved in

a solution of sugar The quantity of sugar used for one part by weight of clean fruit varies from one part in the case of harsh, highly acid fruits like red currants to a half part in the case of cherries or blackberries The process of boiling serves to dissolve the sugar in the juices that flow from the fruit, to sterilize the whole mixture, and to cause the juice to develop the all-necessary setting properties, which are due to the presence of the little known 'pectin bodies' always present in ripe fruits

Commercial jams are boiled for a shorter period than those prepared at home They contain, therefore, a smaller proportion of inverted sugar and on this account home-

the leading industry and the chief products are sugar, coffee, coconuts, bananas, logwood, pimento, ginger, and tobacco Commerce is chiefly with the United States and Great Britain It is famous for its scenery and as a winter resort Kingston is the capital

The island was discovered by Columbus in 1494 and remained a Spanish possession until 1655, when it was taken by the British Jamaica, town, Queens co, New York, forming part of the borough of Queens, New York City, 10 m e of Brooklyn It is mostly a residential place and has many comfortable homes

Jambu-dvīpa, one of the seven divisions



Scene in Jamaica

made jam is superior from a dietetic point of view

Jamaica, the largest of the British West Indies islands, 90 m s of Cuba In the eastern part the Blue Mountains rise to a height of some 5,000 ft, the highest point being known as Blue Mountain Peak, 7,423 ft, the remainder of the island is a high plateau There are several rivers, generally flowing north and south and for the most part swift and unnavigable The climate is remarkably moderate for a tropical country, being cool and delightful in the highlands, though hot and moist on the coasts Mineral springs abound throughout the island

Jamaica is well wooded and the flora, rich and varied, includes the acacia, cactus, orchids, bamboo and mango Agriculture is

of the world according to Hindu cosmogony It is disputed whether the term is applicable to all Asia, or to parts of the interior only

James, the name given to at least three different persons in the New Testament JAMES, THE SON OF ZEBEDEE, and John were fishermen on the Lake of Galilee In company with Peter they form what may be called the inner circle of the disciples James was the first martyr among the apostles, being put to death by Herod Agrippa He is the patron saint of Spain—St Iago or Santiago JAMES, THE SON OF ALPHAFUS, and of Mary, also one of the twelve, is sometimes called James the Little JAMES, THE BROTHER OF THE LORD, or James the Just, was not a disciple, after the resurrection he joined the Chris-



tian community, and soon became head of it

**James, the Epistle of**, the first in order of the so-called catholic Epistles of the New Testament. The writer calls himself 'James, a servant of God and of the Lord Jesus Christ,' and the work is addressed to the Christian Jews of the dispersion, its design being to encourage them in the midst of trials, and to warn them against various doctrinal and practical errors. The traditional hypothesis is that the author of the work was James, the brother of the Lord.

**James I of England and VI of Scotland** (1566-1625), son of Mary Queen of Scots and Lord Darnley, and grandson of James v, was born in Edinburgh Castle. On the death of Queen Elizabeth in 1603, James became king of England and Ireland. His view that he held the kingship by divine right, his impression that Puritanism was the same as Presbyterianism, his wish to tolerate the Roman Catholics, and his determination to exercise absolute power over Parliament, led to conflicts with the House of Commons which continued throughout his reign. From 1612 to 1618 he made strenuous efforts to bring about a marriage between the Infanta of Spain and his son Prince Charles, hoping thereby to secure the peace of Europe. He had already, by his Ulster settlement, begun in 1607, attempted to give peace to Ireland. But the native Irish disliked the settlement, and were not conciliated, and in 1618, the Thirty Years' War broke out, and all hopes of the Spanish match were destroyed. Hoping by diplomacy to secure the restoration of Frederick to the palatinate, James sent Prince Charles and the Duke of Buckingham to Spain. The mission having failed, James made a treaty with Denmark, and arranged a marriage alliance with France. James was known as a good scholar though somewhat pedantic and was so desirous of preserving peace that a vacillating policy made him more or less an object of contempt.

**James II** (1633-1701), king of Great Britain and Ireland, was born in London, the second son of Charles I and Henrietta Maria. The excitement over the popish plot necessitated his retirement from England and in 1679 the Exclusion Bill, to prevent his accession, was brought forward. The same year James returned and was sent to suppress the Covenanters in Scotland, which he did with much cruelty. At the close of 1680 the Exclusion Bill was thrown out by the Lords, and after a stormy period a reaction in favor of royalty set in, which continued

till the death of Charles II in 1685, when he succeeded to the throne. Having overcome the rising of Monmouth, James set up a new Court of Ecclesiastical Commission, and issued his first Declaration of Indulgence. In April 1688 he issued his second Declaration of Indulgence. Seven bishops petitioned against the king's illegal command, and were tried. Their acquittal was followed by an invitation to William of Orange to come over to England and his acceptance was followed by James' flight to France. One of his daughters, Mary, married the Prince of Orange. Another succeeded to the English throne as Queen Anne. His son by his second wife, James Francis Edward, is known as the Old Pretender. Louis XIV received him kindly.

**James I** (1394-1437), king of Scotland, the son of Robert III. He crushed the house of Albany (1425), and forced Alexander, the Lord of the Isles, to submit (1429). While he was endeavoring to strengthen the crown and give his kingdom internal peace, war broke out with England. A defeat of an English force at Piperden, near Berwick, in 1436, was followed by an attempt on the part of an English fleet to capture the Princess Margaret when on her way to France to marry the Dauphin, afterwards Louis XI. James then endeavored unsuccessfully to capture Roxburgh. On Feb. 20, 1437, he was murdered at Perth, the chief conspirators being the Earl of Athole and Sir Robert Graham. He is the author of *The King's Quar*.

**James II** (1430-60), king of Scotland, was only in his seventh year when he succeeded his father, James I. Important legislative enactments mark his reign, and the administration of justice was made more efficient by the establishment, in 1458, of a court or committee of nine representatives of the clergy, nobility, and burghers to deal with judicial matters. Glasgow University was founded by him in 1451.

**James III** (1453-88), king of Scotland, was the son of James II. Until 1466 the government was carried on by guardians. Of these the Earl of Angus died in 1462, and Bishop Kennedy of St. Andrews in 1465, and up to 1483, James was occupied in making himself the real master of his kingdom. Owing to the intrigues of Louis XI, hostilities between England and Scotland recommenced. His weak government provoked a rising of the nobles, which led to his defeat at Sauchieburn, near Bannockburn, and he was murdered while fleeing from the defeat. James III patronized the fine arts, and under him



6 miles, then increases in volume, and for the latter part of its course becomes an imposing estuary of over 50 miles in length and of varying width, flowing through Hampton Roads into Chesapeake Bay

**Jameson, John Franklin** (1859-1937), Amer historian, managing editor of the *American Historical Review*, president of the American Historical Association, director of the department of historical research in the Carnegie Institution in Washington. He wrote many works on American History

**Jameson, Sir Leander Starr (Baronet)** (1853-1917), Scottish physician and South African administrator, born in Edinburgh. Jameson was appointed administrator of Rhodesia for the British South African Company in 1891, and he held this position until the events connected with the raid led to his supersession in January, 1896. He crossed the company's frontier and entered Transvaal territory on Dec 29, 1895, was defeated by the Boers at Krugersdorp on Jan 1, 1896, and again at Vlakfontein on Jan 2, when he and his force surrendered conditionally. This enterprise, known in history as the 'Jameson Raid,' was generally condemned in Europe as well as in America. Jameson and his officers were sent to England to face trial. Jameson was found guilty, and sentenced to fifteen months imprisonment, but was released after about six months, on account of ill health. In 1900 he was returned to the Cape Legislative Assembly as member for Kimberley, and on the death of Cecil Rhodes, in 1901, was elected leader of the Progressive party in Cape Colony. He was premier in 1904-08, was made a privy councillor in 1907, and was a member of Parliament in 1910-12.

**Jamestown, city, New York, Chautauqua co.** Its location at the foot of Chautauque Lake, 1,410 ft above sea level, makes it the center of a great summer recreation region. Nearby on the lake is situated the world-famous Chautauque Institution with its summer school. Jamestown is an important industrial city. The first permanent settlement was made here in 1810 and the village was incorporated in 1827, p 42,638

**Jamestown, district, Virginia, James City co.**, at the mouth of the James River, 45 miles N of Norfolk. Here was established in May, 1607, the first English settlement within the limits of what is now the United States. It was also the seat of the first Legislative Assembly in British America, opened

in 1619, the year in which slavery was first introduced into the English-speaking American colonies by the landing here of a number of Africans. The seat of government was afterward removed to Williamsburg, and Jamestown began to decline.

**Jami, Nureddin Abdurrahman** (1414-92), Persian mystical poet, was born in Jam (Khorassan). At least forty works are attributed to him. Seven of his best writings are included in a collection *Haft Aurang* ('The Seven Stars of the Great Bear'), among which are *Yusuf and Salikha*.

**Jamieson, John** (1759-1838), Scottish philologist and antiquary. His principal work is *The Etymological Dictionary of the Scottish Language*, published in 1808.

**Janet, Paul** (1823-99), French philosopher, was the chief exponent of the idealistic school in France during the second half of the 19th century.

**Janeway, Edward Gamaliel** (1841-1911), American physician, was born in Middlesex co, N J. For six years he acted as the curator of Bellevue Hospital Medical College, with which he was associated for many years. He served as Commissioner of Health for New York City from 1875 to 1882. He was professor of clinical medicine in the newly organized University and Bellevue Hospital Medical College, dean (1898-1905), and professor of medicine.

**Janiculum, The**, a hill on the Tiber, opposite the city of Rome, of which it commands a splendid view.

**Janina, or Yanina**, town and episcopal see, Greece. In 1430 Janina fell into the hands of Turkey, from 1788 to 1818 it was the stronghold of Ali Pasha, the tyrant of Epirus. During the Balkan War it was captured by the Greeks, and by the treaties of London and Bucharest was ceded to Greece, p 24,000.

**Janis, Elsie, Elsie Janis Bierbower** (1889-), American actress. She starred in *The Belle of New York* and other plays and *The Lady of the Shipper* with Montgomery and Stone. She is also the author of plays and her revue, *Puzzles of 1925*, was produced in New York.

**Janizaries**, a Turkish military force organized about 1328 by the Osmanli Sultan Orkhan, who for the purpose selected from the Christian families he had conquered a thousand of the finest boys. They were suppressed in 1826 by Mahmud II.

**Jan Mayen Island**, an uninhabited vol-

canic island, in Greenland Sea. It was probably sighted by Hudson in 1607, and was rediscovered by Jan Mollen in 1611.

**Jans, Anneke** (?-1663), Dutch colonist of New Netherland, concerning whose landed property there arose one of the most long-continued litigations in American history. In 1671 her heirs sold what had been her property, about 60 acres, immediately below Greenwich, now part of New York City, to Governor Lovelace, but the heirs of one of the sons of Anneke Jans did not participate in the sale, certain descendants of the non-participating heirs subsequently brought suit against the Trinity Corporation. Chancellor Sanford of N. Y. decided that the corporation had acquired an indisputable title by prescription.

**Jansenism**, a religious movement in France which takes its name from Cornelius Jansen (1585-1638). Certain statements in his *Augustinus* (1640), were regarded as heretical and gave rise to bitter controversy. The distinguishing features of Jansenism were (1) the doctrine of grace as against the Jesuit doctrine of works, (2) insistence upon a more rigid and puritanic morality, (3) emphasis upon the authority of the Bible and the early councils as against the later developments of the Church, (4) attention to education. Driven from France the Jansenists took refuge in Holland.

**Janssen, Peter** (1844-1908), German historical painter, held a foremost place among modern historical painters in Germany. His most important work, *Walther Dodge and the Peasants of Berg before the Battle of Worringen*, 1288, was awarded the great gold medal in Berlin.

**Janssen, Pierre Jules Cesar** (1824-1907), French astronomer, observed the total solar eclipse of Aug. 18, 1868, at Guntur in India, and initiated next morning the spectroscopic method of viewing prominences in daylight. In 1875, on his return from a third eclipse expedition to Siam, he was appointed director of the new astrophysical observatory at Meudon, and there devoted consummate skill to the art of solar photography. He made ascents of Mont Blanc in 1888, 1890, and 1893, and erected an observatory on the summit.

**Janssens van Nuyssen, Abraham** (?1575-1632), Dutch painter, precursor of Rubens, until the rise of the latter was the greatest historical painter of the time. Among his pictures, the *Burial of Christ* and the *Adoration of the Magi* are pre-eminent.

**Januarius, St., or San Gennaro**, Christian martyr under Diocletian, bishop of Benevento in the latter part of the third century. The place of his martyrdom, in 305, was Pozzuoli, where many Christians suffered the same fate. His body is preserved at Naples, where are also separately preserved the head of the martyr, and two vials of his blood. On three festivals each year the head and the vials are carried in procession to the high altar, where the blood, when the vials are brought into contact with the head, is said to liquefy.

**January**, the first month of the year. It was, among the Romans, held sacred to Janus. It was not till the 18th century that January was universally adopted by European nations as the first month of the year, although the Romans considered it as such as far back as 251 B.C.

**Janus**, one of the most ancient Latin divinities, or *numina*. He was the spirit of the doorway. Since the door was the initium of the house, Janus came to be revered as the divinity presiding over all beginnings, and was the first invoked in both public and private prayers. As the spirit of openings, Janus was the god under whose care were all *januae*, or gates, in Rome, above all, he it was under whose protection was the archway out of which the army marched to war and by which it returned. The tutelary god of the gate that opened both ways was, by a natural transference of thought, himself represented by an image having a double head that looked both ways.

**Janvier, Thomas Allibone** (1840-1913), American author, was born in Philadelphia, and after a prolonged residence in New York made his home chiefly in Provence and in England after 1894. His works include *Stories of Old and New Spain* (1891), *An Embassy to Provence* (1893), *In Old New York* (1894), *In the Saragossa Sea* (1898), *Henry Hudson—His Aims and His Achievements* (1909).

**Japan** (called by its inhabitants *Nippon* or *Nihon*—'sun origin' or 'eastern land'), four islands, Honshu, Hokkaido, Kyushu, Shikoku. Before defeat in World War II she held the Kuriles, which approach Kamchatka, the southern half of Karafuto restored to Japan from Russia by the Treaty of Portsmouth in 1905, Hokkaido or Yesso, which includes also the Kuriles, separated by a narrow strait from Karafuto, Japan Proper, including Hondo or Honshu, the main island, Shikoku,

and Kjusshu, separated by the Strait of Korea from the continent of Asia, the Ryukyu or Lu-chu Islands, Taiwan or Formosa divided from China by the Formosa Channel, and Korea, annexed in August, 1910, and renamed Chosen. The Bonin Islands, a very small group, some 600 miles southeast of Tokyo, also belonged to Japan. In 1905 Russia, with the consent of China, transferred to Japan the lease for 99 years of the Kwantung province, which includes Port Arthur and Dairen.

By the terms of the Peace Treaty of Versailles Japan administered by mandate of the League of Nations, the former German island possessions in the Pacific north of the Equator: the Marshall, Caroline, Pelew and Ladrone groups. Guam, in the Ladrone, is a possession of the United States. Japan is a very mountainous country, the only considerable plain being that of Tokyo. There are many volcanoes. Earthquakes are frequent. The first on record, in 684 A.D., totally submerged 1,200,000 acres of land. On Sept. 1, 1923, Eastern Japan was stricken, without warning, by an earthquake unparalleled in the country's long history of similar catastrophes. Tokyo and Yokohama were destroyed within a few minutes, together with many smaller towns. All these seismic movements may be largely traced to the fact that the shores on the side of the Pacific Ocean are slowly rising, while those bordering on the Sea of Japan are sinking. In addition to earthquakes and tidal waves, Japan is subject to typhoons, winds of cyclonic force which frequently inflict great damage.

The principal rivers are the Tonegawa in the plain of Tokyo, the Ishikawa-gawa, in Yesso, which runs into Stroganoff Bay, the Shinanokawa, which falls into the Sea of Japan at Nagata, and the Tone-gawa which flows into the Sea of Japan near the northernmost point of Yesso. Among lakes, which are formed chiefly through the blocking of natural outlets by volcanic materials, are Lake Biwa, near Kyoto, Lake Suwa, in Shinano, the Chusenji Lake near Nikko, Lake Inawashiro, and the Hikone Lake. With these lakes are associated many of the hot mineral springs which abound in Japan and have high medicinal value. There are numerous fine waterfalls in the province of Kanto, at Nikko, and elsewhere. The coast line of Japan is characterized by extreme irregularity, especially on the eastern shore. The noted Inland Sea with its islands and beautiful irregularity of outline extends from

the Pacific Ocean to the Korean Strait, and its four narrow entrances render it a safe retreat from storm or foe. There are numerous deep bays and many excellent harbors.

The Kuroshio (black tide) current, corresponding to the Gulf Stream of the Atlantic, and frequently called the Japan Current rises between Luzon and Taiwan and flows along the eastern coast of Japan, finally losing itself on the shores of North America. Its constant shift of position greatly affects climatic conditions. The northern parts of the empire are proportionally much colder than places in the same latitude in Europe and America. In Tokyo snow seldom lies long, but in Yesso the snowfall is heavy. Fogs are prevalent in summer in the northern and western parts of the empire. The climate is healthful, on the whole, though depressing on account of excess of moisture. Owing to the frequent severe storms and to the denudation of forest lands, the rivers of Japan are subject to flood. This increases the natural barrenness of the soil.

With its wide range of climate and its lofty mountains, Japan has a great variety of vegetation. There are some 3,200 species of flowering plants and 300 species of ferns. The shrubs are mostly evergreen, comprising many with beautiful flowers. There are also hornbeams, maples with beautiful autumn foliage, plumes, and camphor trees, while many dwarfed trees are carefully cultivated. Fruits of excellent quality comprise oranges, grapes, peaches, and apples, loquats, pomelos, pears, persimmons, figs, and raspberries. The plum and the cherry are prized chiefly for their blossoms. American and European gardens have obtained many beautiful shrubs and flowers such as the *Lilium auratum*, lerris, pyruses azalea, bamboos, chrysanthemums, *Rosa rugosa*, aucuba, and aralia from Japan. As to animal life, Japan has one species of short-tailed monkey and ten species of bats. Of carnivora, the largest is the bear, of which there are two kinds—a small black species peculiar to Japan, and a large brown bear, the grizzly bear of North America, which is common in Yesso. The Felidae are represented by the Korean tiger and the domestic cat.

Domestic mammals are the horse or pig, and dog. Goats are practically unknown, and sheep do not thrive. There are numerous water birds, song birds are not specially numerous. Of all Japanese birds, the *Icteria pumila*, a flycatcher, is the most beautiful.



treaty with the United States. Since 1859, foreign commerce has developed rapidly. From the closing of the ports to foreign commerce in 1638 until their reopening in 1869, Japanese shipping was at a low ebb, and the size of vessels was limited by law. As late as 1892, 77 per cent of the ships visiting Japanese ports were foreign, but since that time shipping has developed greatly. The principal ports of Japan are Yokohama, Kobe, Osaka, Nagasaki, Moji, and Nagoya. The large number of ports in Japan, the rough configuration of the country, and the short distances from inland to sea coast districts have encouraged water transportation.

In 1906 the government acquired most of the railways of the country, and in 1907 a scheme was sanctioned for spending 125,000,000 yen for extension of the existing lines, and 62,500,000 yen for improvements. After the war with Russia, in 1904-05, Japan acquired the lease of some 470 miles of the South Manchuria Railway. Commercial air traffic is increasing. The postal system was organized in 1871, and in 1879 the government assumed complete control. The census of 1946 showed all of Japan to have a population of 73,110,915. The six largest cities are Osaka (3,320,000), Tokyo (6,457,600), Nagoya (1,220,000), Kobe (960,000), Kyoto (1,150,000) and Yokohama (770,000). The damage inflicted upon Tokyo and Yokohama by the earthquake and the fire of 1923 was repaired, and they became handsome, modern cities.

Language and anthropology show that the predominant element in the Japanese race is Mongol. There are two types—one more refined, with thinner and higher nose, more slanting eyes, and smaller mouth, the other, and more common type, having a broad face, flattish nose, and coarser frame. Both have the Mongol sallow complexion, straight black hair, scanty beard, broad skull, and high cheek bones. The average height of the adult Japanese is five feet for men, 4.66 feet for women. Some trace a Polynesian or Malay element in the population, and there is undoubtedly a small Ainu admixture. The Ainu, a hundred race less developed than the Japanese, formerly occupied a large part of the main island. Only a small remnant of about 17,000 now survives. Formosa is peopled partly by an aboriginal population of Malay affinities, and partly by Chinese settlers.

Shinto, the indigenous religion of Japan, is in the main a nature worship. The gods

are innumerable, the chief among them being the sun goddess, from whom the Mikados are supposed to be descended. The priests are not celibate, and wear no special garb when not engaged in worship. The temples are simple structures. Buddhism was first introduced in A.D. 552 from Korea. In Japan it has become split up into twelve sects. Buddhism has a far more gorgeous ritual, finer temples, and a more organized priesthood than Shintoism. Notwithstanding the increased patronage recently bestowed upon Shintoism by the government, Buddhism is still the dominant religion among the people. Confucianism was first introduced into Japan in the fifth century, and its study reached a climax under the Tokugawa Shoguns, when its principles became the chief rule of life for the educated classes of Japan. Loyalty to chiefs and rulers and filial piety are the principal duties which it inculcates. Shintoism, Buddhism, and Confucianism are not, like the Christian sects, mutually exclusive. A man may, and usually does, belong to all three at the same time. Japan is a land of temples, but many are now falling into decay, while others are turned into school houses. Every grove has its shrine and *torii*, a structure in wood or stone, consisting of two upright pillars joined at the top by two transverse beams or slabs, metal torii are also not unknown. Full toleration is extended to all forms of religious belief, in so far as they do not conflict with the peace and order of the community. Francis Xavier introduced Christianity in 1549. The most numerous congregations of the twelve forms of Christianity now in Japan are the Greek Church, the Roman Catholics, the Anglican and American Episcopalian Missions, the Methodist Mission, and the Congregational Mission. Osaka is the centre of the work of the Church Missionary Society, but the bishop who presides over it and the Society for the Propagation of the Gospel resides in Tokyo. The Young Men's Christian Association of America has a resident secretary in Tokyo, and is represented by teachers in almost every province. Since 1868 great progress has been made in substituting for the old Chinese methods a system of national education on European models. An elementary school course of six years is compulsory between the ages of 6 and 14 years. In 1884 the army was organized on the best European models, its much increased efficiency was demonstrated in the wars with China (1894-95) and with Russia (1904-05).

All able-bodied males between the ages of 17 and 40, with the exception of students in foreign countries, elementary school teachers, and a few others, are liable to military service in the army or the navy. Japan was a signatory to the London Naval Treaty of 1930 providing for the limitation of naval armaments and was permitted to lay down the following new tonnage during the life of the agreement (to Dec 31, 1936): Armored cruisers, 12,130, small gun cruisers, 35,655,

na Carta of Japan. It provides for the imperial succession, defines the prerogatives of the Crown and the privileges of the people, declares the obligation of the latter to pay taxes and to serve as soldiers, guarantees them against arrest, imprisonment, trial, or punishment, except by due process of law, grants freedom of residence and conscience, and provides that no man's house shall be officially entered without a legal warrant. Executive power is vested in the Emperor



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Japan Scene in the Kasuga Temple, showing the Famous Brass Lanterns

destroyers 33,795, and submarines 7,200. On Dec 4, 1933 Japan's plans for building her fleet to full London Treaty strength were published at Tokyo, and in 1934 she gave notice of her intention to abrogate on Dec 31, 1936, the Washington Naval Treaty of 1922.

After the revolution of 1868, in which the Shogunate was abolished and the actual sovereignty returned to the Emperor, many reforms were effected, the general result of which was to substitute a constitutional monarchy for the former autocracy. On Feb 11, 1889, a new Constitution was promulgated, which may be called the Mag-

na Carta of Japan, who acts with the aid of a ministry appointed by himself. Legislative power is in the Emperor and Imperial Diet—two chambers: the Upper House of Peers, and Lower House of Representatives elected for four years. There is a Privy Council consulted by the Emperor.

Following Japan's defeat in World War II a new Constitution was adopted. It renounced war forever, forbade the maintaining of an Army, Navy, or Air Force, reduced the power previously held by the Emperor, and voiced a "Bill of Rights." It established, in place of the House of Peers, a House of Councillors, and added a House of Representatives,



also a Supreme Court. It granted equal rights to husband and wife, and it abolished Shintoism.

The laws of Japan, formerly based on those of China, have been radically reformed, and a system of justice founded on modern jurisprudence is now in effect. A marked characteristic of the civil law is the prominence given to the family instead of the individual as the social unit. The judicial system resembles that of France, and includes sub-district and district courts, courts of appeal, and Court of Cassation. The Court of Cassation, or supreme court, is at Tokyo. Trial by jury was first instituted Oct. 1, 1928. Foreign residents of Japan enjoy practically the same rights and privileges as natives. The Currency System of Japan has been radically changed since 1881 when the depreciated note issue was redeemed in silver. In 1897 the present monetary system was established with funds furnished by the Chinese indemnity. The currency is on a decimal system, the unit being the *yen*.

**History**—**EARLY PERIOD**—Modern Japanese historians begin with the Mikado Jimmu, who is stated to have ascended the throne in 660 B.C. But the more trustworthy contemporary records of China and Korea show that for more than a thousand years after the supposed date of Jimmu's reign, nothing existed in Japan which deserves the name of history. The legend of Yamato-dake, a prince of whose valor in conquering the Ainu tribes of Eastern Japan many wonders are related, has no doubt a solid nucleus of fact. It is assigned to the first century. Another fact which may be taken as proved is that, about the second century of our era, Japan was ruled by a female Mikado of great abilities, who is reputed to have conquered Korea. Among other elements of civilization which found their way to Japan from Korea during this period was a knowledge of the Chinese written character and literature. We reach surer ground with the sixth and seventh centuries, when a great wave of Chinese civilizing influences passed over Japan. The government was reorganized on a Chinese model. Local governors were appointed from the capital in the place of the former hereditary chieftains, and a new system of taxation was introduced. The Fujiwara noble clan first came into notice during this period. Its founder was the statesman known as Kama-tari Ko. **NARA PERIOD**—The eighth century coincides roughly with the Nara period of

Japanese historians. Nara is a city of Yamato, to which the capital was transferred in A.D. 710, and it continued to be the seat of government until 784. Literature, architecture, and sculpture all made great progress.

**HEIAN PERIOD**—In 794 the capital was established on the site of the present city of Kyoto, under the name of Heijō, or the 'city of peace,' and it continued to be the residence of the Mikados until the revolution of 1868. During the early part of the Heian period, the Fujiwara family attained to a position of unparalleled influence. The office of Kwambaku, or regent, was hereditary in this family, and as the practice grew of each Mikado, after a few years' reign, resigning in favor of a younger relative, the importance of this office far outweighed that of the crown itself. Under the rule of the Fujiwaras, which lasted until the middle of the eleventh century, Japan enjoyed an Augustan age of literature. Eventually two other noble houses, known as the Gen (or Minamoto) and the Hei (or Taira), began to struggle for supremacy. Both were of imperial origin, and the source of the power of both was in the remoter provinces, where a strong military system had gradually been developed. Their struggles convulsed the country for the last hundred and fifty years of the Heian period.

**KAMAKURA PERIOD (1185-1332)**—After defeating the Hei at the battle of Danoura, Yoritomo, the representative of the Gen family, established his government at Kamakura, not far from Yokohama. The permanent Shogunate dates from this time. Yoritomo, who died in 1199, succeeded by degrees in consolidating his power over the Daimios, as the provincial nobles now began to be called. His descendants ruled only in name, the real power being wielded by men of the Hojo family, under the title of Shikken or directors. But it came to an end in 1333, when a successful expedition was directed by the Mikado Go Daigo, whose previous opposition to the Hojo had been punished by dethronement and exile.

Under the Hojos, learning, literature, and the arts fell into a state of decay from which they were long in recovering. This and the following two periods are the dark age of Japanese history. The power of the great territorial nobles had greatly increased, and in the absence of any effective central control they engaged in continual wars with one another. In 1542 Japan was first visited by a European ship, a Portuguese

merchant vessel. In 1549 the Jesuit missionary Francis Xavier arrived at Kagoshima, and was succeeded by a number of missionaries, whose labors were attended with remarkable success. The rescue of Japan from its long-continued anarchy was due to three men of the eastern military caste—Nobunaga, Hideyoshi, and Iyeyasu. Nobunaga, originally lord of the province of Owari, after annexing by conquest the territories of several of his neighbors, established himself in Kyoto, where he built a stately castle. But his self-imposed task of pacification was still incomplete when he was murdered (1582) by one of his own captains. The work was, however, taken over by Hideyoshi, another captain.

In 1588 he had himself appointed *taiko*, or regent, and in 1590 the last of the unruly Daimios tendered his submission. The arrogant and intolerant attitude and the greed for power of many individual missionaries induced Hideyoshi to order the expulsion of the Jesuits. The concluding years of Hideyoshi's life were stained by the unprovoked invasion of Korea (1592-98). Few of the inhabitants escaped destruction, to this day Korea has not recovered from the devastation. **YEDO PERIOD (1603-1868)**—Hideyoshi, dying in 1598, bequeathed his authority to his son Hideyori, a lad seven years old. But Iyeyasu, a powerful eastern noble who had served with distinction under Nobunaga and Hideyoshi, soon found it necessary to assume the reins of government. Three years later he was made Shogun, thus founding the Tokugawa military rule of Shoguns, which lasted until 1868. Iyeyasu was among the greatest statesmen that Japan has known. To his genius is due the system of government under which Japan enjoyed peace for two and a half centuries, and grew enormously in wealth, enlightenment, and civilization. The vital feature of his *régime* was the arrangement for the control of the feudal nobles, or Daimios. Their position somewhat resembled that of mediatized princes in India under British rule. Both Fudai and Tozama Daimios enjoyed fiscal and judicial autonomy within their own dominions, but they might be deposed or transferred elsewhere for incompetence or misconduct.

An important feature of the Tokugawa system of government was the rule, initiated by the third Shogun, Iyemitsu, by which the Daimios were obliged to reside in Yedo, the capital of the Shogunate, for part of

every alternate year—a provision which was subsequently extended by compelling them to leave their families there as hostages during their absence. Thus, with the general prosperity of the country, led to an enormous increase in the population of the capital. The eight rich provinces adjoining Yedo, which Iyeyasu had made his capital, were under a different *régime*. They were occupied by the Hatamoto, a minor class of nobles, who were wholly dependent on the Shoguns. Iyeyasu also took care to placate the Mikado, by causing a new palace to be built for him, and by taking other steps for his material welfare. But no real authority was allowed him during the Tokugawa period. The persecution of Christians, begun by Hideyoshi, was continued under his successor. In 1614 he ordered, partly on political grounds, that all foreign Christians should be expelled from Japan. Trade was prohibited (1624) to the Spanish and Portuguese. The Dutch and Chinese were allowed to continue sending ships to Japan, but they were confined to and almost imprisoned in narrow settlements, and conducted trade under great restrictions.

But in the nineteenth century there were symptoms of approaching change. The peasants were uneasy under a grievous load of taxes, levied to supply the means by which Shoguns and Daimios maintained vast numbers of useless officials and so-called soldiers, and kept up state ridiculously disproportionate to their real power. Some collisions with British and Russian men-of-war early in the century revealed the utter disorganization of the Japanese military system. The control of the central government had become relaxed to such a degree that many of the western Daimios were practically independent. A small but enthusiastic body of students had learned Dutch as a medium for acquiring the art of medicine and some knowledge of military matters, thus preparing the way for wholesale adoption of foreign ways. Such was the state of affairs when, in 1852, Commodore Perry arrived in the Bay of Yedo in command of four ships of war, and bearing with him a letter from the President of the United States, in which he proposed the establishment of commercial relations with Japan. The Shogun's government had recourse to the usual policy of the weak—delay. But when Perry arrived a second time with an increased force, they reluctantly signed a treaty in 1854, by which several ports in Japan were

opened to commerce. Subsequently treaties were concluded with other powers. The Shogun was at once charged by the Daimios with pusillanimously yielding to the demands of the barbarians. The Mikado, instigated by some of the western Daimios, now began to assert his authority in an unwanted manner, and he directed the Shogun to take steps for the expulsion of the barbarians. The murder in 1862 of an Englishman named Richardson on the Tokaido (the great highway from Yedo to Kyoto) by the retainers of Shimadza Saburo, a Satsuma noble, led to the bombardment and burning of Kagoshima by a British fleet. Meanwhile the Daimio of Choshu, whose forts commanded the Straits of Shimonoseki, began to fire on foreign vessels of various nationalities which were passing through the straits. An indemnity of three million dollars was subsequently paid for this affair by the Japanese government.

**MODERN HISTORY**—The Shogun, Hitotsu-bashi, of weak character, was eventually deposed in 1867 by the Mikado. The Mikado proceeded to Yedo, thenceforth known as Tokyo, or the 'eastern capital,' and the work of reorganization was begun with great vigour. A most important and necessary change was the abolition of the feudal system. The ex-Daimios and their retainers received pensions, their territories were gradually but rapidly reorganized as prefectures in complete subjection to the central government. The arrangement by which foreign powers had jurisdiction over their subjects resident in Japan was long a sore point with the Mikado's government, and at last, in 1889, foreigners resident in Japan became amenable to Japanese law. The constitutional government promised by the Mikado in the early years of his restored power became at length a reality in 1889.

By the Treaty of Tientsin, negotiated by Count Ito and Viceroy Li Hung Chang, Japan and China had agreed to withdraw their troops from Korea, but Chinese influence had continued to dominate the country under the able direction of Yuan Shikai. An open rupture between China and Japan concerning Korea was now due to the growth of a new religious movement, known as Tong Hak. The Tong Haks rose against the tyrannical Korean Government, who enlisted the aid of China to suppress the rebellion. In violation of the Treaty of Tientsin, the Chinese Government sent troops once more to Korea, explaining to Japan that it was her practice to protect her 'trib-

utary states'. It was impossible for Japan to accept the situation she declared war. A battle was fought at Ping Yang in which the Japanese, led by General Nodzu, secured an easy victory and the Chinese troops were soon expelled from the Korean mainland. The Pescadores were seized and, with the landing of troops in Formosa, the war ended in complete victory for Japan. The Treaty of Shimonoseki gave Japan an indemnity of 200,000,000 taels and secured for her the Pescadores, Southern Manchuria and the province of Liao-tung. France and Germany supported Russia's protest against the cession of Liao-tung and Japan was compelled to yield and accept, instead, the island of Formosa, known now as Taiwan.

Three years later, Russia herself obtained Liao-tung from China, together with the right to construct a branch of the Trans-Siberian Railway through Manchuria. Russia was pledged to withdraw her forces from Manchuria in 1903, but she continued to pour troops into that nominally Chinese province and steadily encroached upon Korea. Japan's Note to Russia, in protest, was ignored, and consequently, on Feb. 8, 1904, Japan commenced hostilities by a torpedo attack on Port Arthur.

The war that followed, known as the Russo-Japanese War, firmly established Japan as a power in the modern world. Russia had been considered mighty, yet a continuous series of Japanese successes by sea and land ended in the surrender of Port Arthur by General Stoessel on Jan. 2, 1905. The Japanese in March captured Mukden and drove the Russians northward in disastrous flight, and, on May 27-28, the Russian combined fleets under Rozhdestvensky were annihilated by Togo at the great naval battle of Tsushima, in the Straits of Korea.

As a result of the mediation of President Roosevelt, Russian and Japanese commissioners met at Portsmouth, N. H., and a treaty of peace was signed on Aug. 29, 1905. The suzerainty of Korea was transferred to Japan, and the southern half of Sakhalin (renamed Karafuto) was ceded to her. Russia surrendered the lease of the Liao-tung peninsula and the southern section of the Manchurian Railway, from Port Arthur to Kwang-cheng-tse, and paid \$20,000,000 for the maintenance of her prisoners. The evacuation from Manchuria of the military forces of both nations was agreed upon. This led to the famous Anglo-Japanese Alliance, signed in London on August 12, 1905, to se-

cure the continuance of peace in Eastern Asia, and the defence of the high contracting parties' special rights there. The maintenance of the independence and integrity of China was now considered assured, together with equal opportunities for the commerce and industry of all nations.

Following the outbreak of the World War in 1914, Japan, in accordance with her treaty of alliance with Great Britain, declared war on Germany, she formally disclaimed any intention of permanently acquiring territory. A Japanese squadron operating in the China Sea and the Pacific shepherded von Spee's fleet, which had left Tsing-tao before it was invested, towards the ships of Admiral Craddock off the coast of South America. The British patrols on the coast of North America were assisted by Japanese cruisers. No troops were sent to European theaters of war, but Japanese torpedo-boats, under the command of Admiral Saito, convoyed allied merchantmen in the Mediterranean throughout the war. In 1918 an allied force was landed at Vladivostok to aid the Czechoslovaks and the White Russians and to protect the munitions supplied to Russia by the United States. The commander-in-chief of the allied forces was the Japanese General Otani. In 1915, Japan presented to the Chinese Government the Twenty-One Demands, designed to consolidate her position on the mainland of Eastern Asia. Secret clauses sought to provide China with Japanese advisers in political, financial and military matters and to exclude any but Japanese capital for railways, harbors and mines in the province of Fukien, opposite to the Japanese island of Formosa. Two treaties were concluded, extending to 99 years the leases of Port Arthur, Dairen, the South Manchurian Railway and the Antung-Mukden Railway. Thus the lease of the Kwangtung peninsula expires in 1977, of the South Manchurian Railway in 2002 and the Antung-Mukden Railway in 2007.

The United States recognized the special interests of Japan by the Lansing-Ishii agreement of 1917. In 1918 T. Hara, leader of the Seiyukai, the conservative party, succeeded Saionji as Premier and was the first commoner to hold the office. The cabinet, unlike earlier ones, was composed of members of a political party and thus resembled those of European countries. The Treaty of Versailles had transferred to Japan the former German lease of Kiao-chau, China, and the German-owned railways, mines and other

properties in Shantung. On August 3, 1919, the Japanese foreign office issued a statement of its intention 'to hand back Shantung in full sovereignty to China, retaining only economic privileges,' which was unsatisfactory to the Chinese, who established an effective boycott against Japanese imports, declining to enter into negotiations on the question. Meanwhile, the continued occupation of eastern Siberia by Japanese troops led to frequent clashes with the Russian forces, and from 1920 to 1922 various diplomatic situations arose. Almost unanimous official and editorial opinions were in favor of renewing the Anglo-Japanese alliance, due to expire in July, 1921. However, the fear of the British people that it might involve their country in a war on the side of Japan against the United States became general. In America, moreover, enactment of an anti-alien land law by the legislature of California in 1920 brought attention to the immigration question. Sentiment in Japan, greatly agitated, admitted the legality of such acts as these but condemned them as discriminatory and insulting. The outstanding questions finally were thoroughly thrashed out at Washington. Representatives of the United States and Japan met in conference in November, 1921, with those of Great Britain, France, Italy and China. The Anglo-Japanese alliance was replaced by a Four-Power Treaty between Great Britain, Japan, the United States and France. A Five-Power Treaty provided that Japan should maintain a standard in capital ships ranking third after the United States and Great Britain, in the ratio of 5-5-3, giving Japan a tonnage of 315,000 against 525,000 tons to each of the other Powers. By a treaty signed in Peking, Jan. 20, 1925, Japan recognized the Soviet Government of Russia.

Meanwhile, at home, an epochal event was the passage on Mar. 29, 1925, of the 'manhood' suffrage act, abolishing the tax qualification and conferring the vote upon 10,000,000 men, thus increasing the electorate to 14,000,000. Inconsistent with these progressive actions was the passage of a 'peace preservation' act making it a felony to agitate for the overthrow of fundamental national principles or the form of government or to denounce the system of private property. Under this law a new political party, the Proletarian Party, was dissolved after an existence of three hours on the ground that its published principles were communistic. Viscount Takahashi resigned the presidency

of the Seiyukai in April, 1925, and General Baron Guchō Tanaka, head of the Choshu or army clan and former minister of war, was elected to the position. The financial crisis which occurred in the spring caused the fall of the government and opened the way for the appointment of General Baron Tanaka to the premiership, which occurred on April 18, 1927. The new government declared itself for a more positive policy at home and abroad. The Peking tariff conference, arranged for in one of the treaties signed at Washington in 1922, was convened in October, 1925.

Japan also played a notable part in the unsuccessful naval conference between that country, Great Britain and the United States at Geneva in July-August, 1927. Since the Washington Conference she had maintained a consistent building policy within the limits of the treaty and her aim at Geneva was to hold her position while assuring herself against an expensive programme of competitive building. Her influence, therefore, was exerted against further naval expansion. But civil warfare in China which was principally responsible for the failure of the Conferences threatened to extend into Manchuria. The Japanese Government forbade hostilities within the South Manchuria Railway zone and sent troops to 'assure the neutrality of the area'. Baron Tanaka declared officially that fighting would not be permitted in Manchuria between Chinese factions and that 'Japan may possibly be constrained to take appropriate effective steps for the maintenance of peace and order in Manchuria'. The Japanese constitution provides that the Emperor alone 'declares war, makes peace and concludes treaties,' and this fact aroused protests when the Kellogg Pact was signed, for it opened with the Declaration that the contracting parties condemned recourse to war 'in the name of their respective peoples'. In April the Premier had to apologize to the Privy Council for signing the Tsinanfu Agreement with the Chinese Government without their prior assent. The death of Marshal Chang Tso-lin, the Manchurian leader, as a result of the bombing of his train on the Japanese-controlled South Manchuria Railway, led to the final downfall of Tanaka's Ministry. The report of the Japanese investigators into the occurrence was suppressed by the Government but it leaked out that they had held the local army officials responsible for the deed and that some of them had been punished. Tanaka's posi-

tion became untenable and he resigned on July 2, 1929.

A new cabinet was formed July 2, 1929, by Yuko Hamaguchi, leader of the Minseito party. An exceptionally able ministry, including such outstanding figures as Foreign Minister Shidehara and Finance Minister Junnosuke Inouye, it strove to liberalize Japan's governmental institutions and policies and embarked upon a temporarily successful struggle against the militarist element. The Minseito program called for economic retrenchments, limitation of armaments, and Sino-Japanese cooperation. On this platform it won an overwhelming victory in the Diet elections of Feb 20, 1930. By signing the London Naval Treaty of 1930, limiting the navies of Japan, Britain and the United States, the government paved the way for substantial economies. Although bitterly opposed by the 'big navy' men and the militarists, the treaty finally received the approval of the Privy Council on Oct 1, 1930, and was ratified by the Diet. Baron Shidehara also made efforts to conciliate the Chinese. On March 12, 1930, he gave Japan's consent to China's tariff autonomy.

These liberal policies, however, were neither successful nor popular with powerful elements in Japan. Meanwhile the onset of the world economic depression carried the government's deflationary policies to unexpected and disastrous extremes. The inauguration of the Chinese boycott in the summer of 1931 dealt another blow to the Minseito policies which the military were quick to take advantage of. On Sept, 18, 1931, the military chiefs defied the government and commenced the conquest of Manchuria. Convinced of the failure of Shidehara's conciliatory policy, the Japanese public swung to the army's support. The Minseito Cabinet was forced to defend before the world the actions of the army, which it privately opposed.

The Minseito Government was overthrown Dec 11, 1931, as a result of an intrigue led by Home Minister Kenzo Adachi. Reactionaries assassinated former Finance Minister Inouye Feb 9, 1932, and Baron Takuma Dan March 5. By machine politics they captured a majority in the Diet in the election of Feb 20, 1932. On May 15 a band of military cadets and young naval officers assassinated Premier Inukai for 'patriotic' reasons, enabling the military to insist upon a non-partisan 'national' government in which they obtained complete control of foreign affairs.

The new cabinet formed by Admiral Saito represented a compromise between the Fascists and parliamentarians. The military were given a free hand in Manchuria and North China. Between Sept 18, 1931, and the signing of the Tangku truce with the Chinese Nationalist Government on May 31, 1933, Japan added some 500,000 square miles of rich territory in Manchuria and Jehol to her economic domain. The Japanese onslaught in Shanghai on Jan 28, 1932, was provoked mainly by the boycott.

In March, 1932, Japan arranged the establishment of a new state in Manchuria to be called Manchukuo. Its head, Henry Pu-yi, former boy Emperor of China, was crowned March 1, 1934. But the establishment of Manchukuo was carried through in the face of strong opposition from the Soviet Union, the United States, the League of Nations, and world opinion. It led to Japan's moral and diplomatic isolation, to her notice of withdrawal from the League of Nations on March 27, 1933, and to extremely strained relations with the Soviet Union and the United States.

Premier Okada followed Saito in mild policies. American-Japanese relations improved somewhat during 1933, partly as a result of Viscount Kikujiro Ishii's conversations with President Roosevelt. Later, it was announced that the American Atlantic fleet would soon return to its home waters from the Pacific. This announcement served to relieve Japanese fears. It was offset, however, by the resumption of diplomatic relations between the United States and the Soviet Union on Nov 17, 1933. Rivalry between the United States and Japan in naval construction was resumed in 1934, when Japan gave formal notification that at the expiration of the London Naval Treaty in 1936 she would demand naval parity with the American and British fleets.

In March, 1935, Japan's withdrawal from the League of Nations became effective. Spring of that year found the United States fleet engaged in new maneuvers in the Pacific.

With the rapid development of the military party's power came a rise of Fascism or extreme nationalism. In Tokyo several thousand soldiers mutinied because of the anti-fascist victory in the parliament elections of February 20, 1936, and on February 25 tried to seize the government. Led by 23 young officers, they took several public buildings, assassinated Admiral Makoto Saito, Keeper of the Seals, Finance Minister Takahashi, and Lieut.-General Watanabe, and seriously injured the Grand Chamberlain, Admiral Su-

zoku. On March 9, 1936, Premier Okada and his Cabinet resigned, and a new cabinet was formed with Koki Hirota at its head.

The government of Hirota continued the penetration of China and the anti-Soviet policy favored by the military elements. An anti-Communist propaganda alliance was formed with Germany which was interpreted by the Soviet as being, in fact, a military alliance against Russia. Many of the conservative leaders, as well as the liberals of Japan, were opposed to the anti-Soviet pact, and by January, 1937, the Hirota cabinet was displaced by one formed by Senjuro Hayashi. On February 14, 1937, Premier Hayashi in an address to the parliament made a bid for friendship with China and Soviet Russia.

A few months later Japanese military, naval and air forces violently attacked China in an undeclared war, seizing a vast amount of Chinese territory and several cities.

In 1938-42, Japan pushed on with her conquest and extended her holdings in China. In 1941 Japan seized French Indo-China. On Dec 7, 1941, while her delegates were talking peace in Washington, Japan concentrated her air forces in an attack on Pearl Harbor, Hawaii, and Japanese troops landed on Malaya, Luzon, Wake, Midway and Guam. The U S and England declared war on Japan, Dec 8. In 1942 Japan gained footholds in Asia and Oceania, enormously strengthening her power, adding to her empire about 1,600,000 sq miles, gaining control over vital productions, and winning strategic bases. The government, under Premier Tojo, assumed dictatorial powers. But in 1943 Japan began to feel the force of Gen MacArthur's resistance and the next year turned the tide, due in large measure to the B-29 Superfortress bombing raids, which worked havoc on Japan's war industry. Emperor Hirohito ordered Gen Koiso to form a new war cabinet. 100 Japanese admirals mysteriously 'died'. Stories of inhuman cruelty in the treatment of American prisoners became current. In Feb 1945 MacArthur was back in Manila. A new Japanese Premier, Gen Suzuki, was named. In August the new atomic bomb was used by the United States on the cities of Hiroshima and Nagasaki, at the same time Russia declared war on Japan. Japan then surrendered and Gen MacArthur entered Tokyo, to take command of the country. Never before, in her long history, had Japan been under control of a foreign power.

Following the signing of surrender, Sept

2, 1945, Gen MacArthur ordered the arrest of militarists as war criminals, the breaking-up of industrial combines, the disestablishment of Shintoism, and the introduction of political and economic democracy. In May 1947 a new Constitution went into effect, renouncing the maintenance of armed forces and reducing the throne to the status of a "national symbol."

**Japan—Language and Literature** The Japanese language belongs structurally, like Korean and Manchurian, to the Altaic family. The introduction of Chinese civilization in the sixth century was followed by a wholesale absorption of Chinese words and characters. Chinese ideographs are said to have been reduced to a phonetic syllabary by the Buddhist priest Kobodaishi in 810. In process of time this system, the *Hiragana*, led to the introduction of another and simpler alphabet, known as the *Katakana* character. A movement, powerfully supported, has been on foot to introduce the Roman alphabet. In Japan, books are written either in Japanese or in Chinese. Chinese is preferred for history, science, law, and theology—in short, for all serious subjects, while Japanese is the language of essays, poetry, fiction, the drama, and, in recent times, for the magazine and newspaper press. The earliest extant book, a mythological and historical work called the *Kojiki*, belongs to 712 A.D. It is written in a strange compound of Japanese and Chinese.

The Poetry of Japan is contained chiefly in the collections called the *Manyōshū* and *Kokinshū*, ancient and modern collection, made in the ninth and tenth century respectively. It is distinguished from prose by the regular alternation of phrases of five and seven syllables, and by the exclusion of words of Chinese origin. There are no epics, no didactic, philosophical or satirical poems, and indeed no long poems of any kind. The great age of Prose was the Heian period (794-1185). It has left us a considerable mass of fiction, essays, and a few quasi-historical works, containing a strong element of romance. The two greatest writers of this time were women. One, Murasaki no Shikibu, is famous for a portentously long novel of Kyoto court life, named the *Genji Monogatari*, and the other, Sei Shonagon, for a series of charming essays and sketches called *Makura no Soshi*. The Drama dates from about the same time. The *No* are short lyrical pieces of six or seven pages, which could be acted in an hour. Two or three

hundred of these remain, most of them belonging to the fifteenth century.

The political movement which culminated in the establishment of the Tokugawa Shogunate was accompanied by an intellectual revival. Chinese political and moral philosophy were earnestly studied, and a literature which derived its inspiration from this source was the result. It was the day of the Kangakusha, Chinese scholars, as they were called. There was a revival during the Yedo period of the Shinto religion. It had a literature of its own in a pure Japanese style, illustrated by the great names of Motoori and Hirata. In the seventeenth and eighteenth centuries Saikaku, Jisho, and Kiseki produced numerous stories and sketches. The end of the eighteenth and the beginning of the nineteenth century are illustrated by the names of Kioden, Bakin, and Tanchiko, writer of romantic stories. Novels of sentiment were largely written in the first half of the nineteenth century, when there also flourished Samba and Ikku, two humorists of no small merit. Fiction received a fresh impulse from the stirring of national thought caused by contact with European ideas in the last century. There is a most prolific school of novelists who have learned much from Europe—Rohan, Bimyosai, and Koyo being among the most distinguished.

**Japanese Art** Tradition says that the art of painting was first introduced from China in Yuriaku's reign (457-479). The oldest extant picture is a Buddhist mural decoration in a temple near Nara. In the fifteenth century there was a great revival of painting under Chinese influence. Three important schools appeared, named respectively the Sesshu (after one of the greatest of Japanese artists), Kano, and Yamato-Tosa. The most important of the more recent schools was the Ukiyoye, or popular school, whose members painted the life of the people among whom they lived. Among the great artists of Japan are Cho Densu, d. 1427, the best and most original painter of the Buddhist school, Kano Motonobu, b. 1435, an avowed imitator of the Chinese, Hanabusa Itcho, of the Kano school, towards the end of the seventeenth century, Korin, who founded a school of painting in the seventeenth century, and was also an artist in lacquer, Okio, a close student of nature, who died in 1795.

To the eighteenth and early nineteenth centuries belongs the great name of Hokusai, who is famous as a book illustrator and

print maker as well as a painter. Mori Sosen (1747-1821) was the greatest animal painter of Japan, and Bunrin (died 1877) a famous landscape painter. Kiosai, a writer and illustrator, is known especially for the vigor and abandon of his figures, particularly those of children. Closely allied to the art of painting is that of printing from colored woodcuts, in which the Japanese are unexcelled. A Japanese print, unlike the print produced by the ordinary mechanical processes, is really a water-color picture produced by hand pressure, no press of any kind being used, the printer is an artist rather than an artisan. Among the most famous print makers are Kioyobu, Moronobu, Harunobu, Toyokuni, Katsugawa Shunsho, Toshiusai Sharaku, Hiroshige, Kabo Shunman, Hokusai, and Kitagawa Utamaro, the last two perhaps the best known.

In the Mechanical Arts the Japanese have attained a high degree of excellence, especially in metallurgy, and in the manufacture of porcelain, lacquer ware and silk fabrics. Metal work is exemplified in the large bronze idols which are everywhere to be seen. The porcelain industry virtually dates from the thirteenth century, when Toshiro, the 'Father of Pottery,' flourished at Seto in Owari, hence the Japanese name Setomono for all kinds of earthenware. Japan is also indebted to Korea, whose artisans invaded the country on the invitation of Japanese nobles. To these Korean craftsmen Japan owes the celebrated crackled Satsuma, which dates from about 1640, the Hizen, the Kaga, and the Owari. The lacquer industry is of prehistoric origin, it reached its acme of perfection toward the end of the seventeenth century. The bronze and inlaid metal work of Japan is highly esteemed. Silk weaving is carried to high perfection. For want of a suitable material, Japan has done little in stone carving, though many carved wooden idols of artistic merit are in existence. Ivory carving takes the form of statuettes. Truth to nature, humor, and consummate skill characterize these tiny productions.

**Music**—Isawa, a Japanese authority, says that in the classical music of Japan the intervals of the second, fourth, and sixth are identical with those in the European scale, but that the third is sharper and the seventh flatter, and that in popular music the scale is different. The Japanese musical instruments comprise the *koto*, a harp or lyre with thirteen strings, the *kokin*, a species of violin, the *samisen*, a three-stringed gui-

tar, the *sho*, a kind of mouth organ, various forms of flutes and pipes, drums, cymbals, and other percussion instruments.

**Architecture**—The architecture of Japan is similar to that of China. Wood is the universal material. Skilful landscape gardening is famous.

**Japanning** is the process of producing, by the aid of heat, a hard coating of colored varnish upon metal, wood, leather, or papier mâché. Articles so coated resemble the lacquer wares of Japan and China.

**Japan Sea** lies between Japan and Korea and Siberia. It extends some 500 m from n to s, and 600 m from e to w. It is almost tideless.

**Japheth**, or **Japhet**, the second son of Noah, and the ancestor of a number of tribes who came to occupy 'the isles of the nations.'

**Jararaca**, a venomous snake (*Lachesis jararaca*) of South America.

**Jardine, James Tertius** (1881- ), agriculturist, was a specialist in research, U S Office of Education, 1927-1930, and Chief, Office of Experiment Stations, since 1931. He also lectured at Yale University.

**Jardine, William M** (1879- ), American agronomist. He was acting director and director of the Kansas Experiment Station and dean of the State Agricultural College from 1913 to 1918. In the latter year he became president. In March, 1925, he was appointed Secretary of Agriculture by President Coolidge.

**Jargon**, or **Jargoon**, is a colorless, yellowish, smoky, or gray zircon, obtained from Ceylon, and long supposed to be a worthless variety of diamond.

**Jarrah** (*Eucalyptus marginata*), an Australian tree of great economic value on account of the hardness and durability of its wood.

**Jarrow**, municipal borough, England. The church of St Paul, which contains a *Crucifixion* by Vandyck, formerly belonged to a Benedictine monastery, founded in the seventh century, and famous as the scene of the labors of the Venerable Bede. Paper and chemicals are manufactured, and coal is shipped, p 35,590.

**Jarves, James Jackson** (1820-88), American writer and art connoisseur. From 1879 to 1882 he was United States vice-consul and acting consul in Florence, and while there he made a valuable collection of paintings and other objects of art. His collection of Venetian glass was presented to the Metropolitan



Museum of Art, New York City, in 1881 Jarves' publications include *Art Studies*, *the Old Masters of Italy* (1861), *Gl glimpses at the Art of Japan* (1876), *Indian Rambles* (1884)

**Jarvis, John Wesley** (1780-1840), American artist His pictures include portraits of *Governor De Witt Clinton* and *Bishop Benjamin Moore*. Examples of his work are to be seen in the City Hall, New York, in the Metropolitan Museum of Art, and in the collection of the New York Historical Society

**Jashar, Book of, or Jasher** (Hebrew, *Sepher hayashar*, 'the Book of the Upright'), an ancient Hebrew collection of songs, no longer extant



*Yellow Jasmine (Gelsemium nudiflorum)*

**Jasmine, or Jessamine** (*Jasminum*), a genus of plants of the olive family, including many cultivated varieties, most of them shrubs with long twining branches and bearing fragrant flowers The Carolina Jasmine (*G sempervirens*), or Yellow Jasmine, is a native climbing plant of heavy fragrance found throughout the South Atlantic States

**Jason**, the name of several persons in the Apocrypha, and of one in the New Testament The New Testament Jason was the host of Paul at Thessalonica and, according to tradition, bishop of Tarsus The most dis-

tinguished Jason in the Apocrypha is the degenerate high priest who superseded his brother Onias III, by giving a bribe of 440 talents of silver to Antiochus Epiphanes

**Jason**, in ancient Greek legend, the leader of the Argonautic expedition, was the son of Æson and Polymede His father's half brother, Pelias, tried to kill him, but he was rescued and was brought up by the Centaur Chiron Having grown to manhood, Jason demanded his father's kingdom from Pelias, who promised its restitution on condition that Jason secure the golden fleece from Colchis This he accomplished with the help of the other heroes who had been his fellow pupils with Chiron, and with the aid of Medea, the daughter of the king of Colchis, whom he made his wife

**Jasper** (Greek *Iaspis*), an abundant mineral generally regarded as one of the varieties of quartz, composed chiefly of silica mixed with clay or other substances, and essentially similar to flint, chert, and chalcedony

**Jassy, Yassy, Jashi, or Iasi**, city, Roumania, capital of the depart of Jassy, 5 miles w of the River Pruth and 205 miles north-east of Bucharest It is the see of a Greek Orthodox metropolitan and of a Roman Catholic bishop, and has a university

**Jastrow, Joseph** (1863-1944), American psychologist, professor of psychology, after 1903, in the University of Wisconsin His works include *Keeping Mentally Fit* (1928), *Effective Thinking* (1931), *The House That Freud Built* (1932), *Wish and Wisdom* (1934)

**Jastrow, Morris** (or Marcus) (1829-1903), American rabbi and scholar, was assistant rabbi in Warsaw, but was obliged to leave Poland (1861) because of his political beliefs, and went to the United States in 1866, where he was rabbi in Philadelphia until 1892 and thereafter pastor eminentus He was a profound Talmudic scholar

**Jastrow, Morris, Jr** (1861-1921), American Orientalist, son of Morris Jastrow His works include *Aspects of Religious Belief and Practice in Babylonia and Assyria* (1911)

**Jātaka**, the name of a book of the Buddhist religion, containing 550 legends dealing with the earlier births of the Buddha

**Jaundice, or Icterus**, not itself a disease, but merely a symptom, may arise from diverse pathological conditions, and produces that characteristic yellow pigmentation of the tissues which is known as icterus

**Jaunpur**, town, India, capital of district of Jaunpur in United Provinces, on the left

bank of the Gumi, 37 miles northwest of Benares. It is famous for its perfumes and is archaeologically interesting for its ruins.

**Jaurès, Jean** (1859-1914), French political leader, became the leader of the Socialist group in the Chamber. He was an earnest defender of Dreyfus, a bitter opponent of militarism, and an advocate of arbitration. His attacks on militarism aroused such resentment that he was assassinated by a half-demented fanatic. He contributed largely to *Histoire socialiste, 1789-1900*, and to various periodicals.

**Java**, most important and most populous of the islands of Indonesia, lying between the Java Sea on the n and the Indian Ocean on the s, with Sumatra to the w and the small island of Bali on the e. It lies in the great volcanic belt of the Malay region and has several active and many extinct volcanoes. It is an alluvial plain in the n and there most of the towns are situated. The southern coast is rocky and precipitous. The rivers are short and of little value for navigation, and the principal mountain peaks are Smeru, 12,028 ft, Slamet, 11,244 ft, and Merapi, 9,469 ft. The climate is tropical, in the lowlands it is hot and the humidity is high, in the mountainous parts it is somewhat cooler. The rainfall is heavy. There is the typical wet and dry season. Java is the poorest of the East Indies in mineral wealth. The island is primarily an agricultural land and the people are mainly engaged in agricultural pursuits. Their staple food is rice and that is the main product. Teak forests cover a large area in Central and East Java and teakwood is used for all purposes where wood is needed.

Industries are limited to home products such as hat plaiting, copper work and batik cloth. The natives are of Malay stock but known as Sudanese in the western part, Javanese in the central and northern parts, and Madoerese in the eastern part. Java derived her earliest civilization from India whence Buddhism, followed by Sivaism, was introduced in the fifth and seventh centuries. Remains of huge temples and Hindu art show that powerful states must have existed during the early history of the island of which that of Madjapahit was the most dominant. This lasted from about 1375 to 1475 when it fell before the assaults of Islam. About 1520 the Portuguese reached the shores of Java and toward the end of the century the Dutch began to establish themselves and fix trading stations along the coast. From 1811 to 1816

it was held by the British under Sir Stamford Raffles, and in 1817 it was restored to the Netherlands. Java was overrun by the Japanese early in 1942 and freed in 1945. Consult Raffles' *History of Java*, Campbell's *Java, Past and Present* (1915), Vlekke's *Story of the Dutch East Indies* (1945).

**Java Sea**, the sea which lies between Java and Borneo, and reaches from Sumatra on the w to Celebes on the e. It is also known as the Sundra Sea.

**Java Sparrow** (*Munia oryzivora*), one of the commonest of Oriental weaver-birds, known to English-speaking people of India and the farther East as 'rice-bird' or 'paddy-bird,' since it has spread and become a pest wherever rice plantations exist. It is indigenous to Java, Malacca, and Sumatra. The body is grayish-blue, with the rump, tail, and crown black, and usually a conspicuous white patch on the cheek. It is widely known as a cage bird and in confinement has been developed in a pure white breed which is very attractive.

**Jaworow**, tn, Poland, in Galicia, 30 m northwest of Lemberg. The castle has renowned Italian gardens, which were the favorite resort of John Sobieski, king of Poland.

**Jay**, a bird of the garruline section of the crow family (Corvidae), usually with plumage in which blue is the prevailing tint, with short wings, long tail, and an erectile crest. Jays occur in most temperate and warm countries and are active, noisy birds, taking their name from their harsh call-note. The typical and most familiar jay in the United States is the bluejay (*Cyanocitta cyanea*), which is resident throughout the year in all but the more northerly parts.

**Jay, John** (1745-1829), eminent American statesman and diplomatist, of Huguenot descent, was born in New York City. In the period immediately preceding the outbreak of the American Revolution he ardently embraced the Whig or Patriot cause, but allied himself with the conservative rather than with the radical elements of the opposition to the arbitrary measures of the British ministry. During the Revolution he was a member of the Continental Congress (1774-7 and 1778-9), was its president during the second period, drafted the 'Address to the People of Great Britain,' which was issued by Congress (1774) and which Jefferson, when ignorant of its authorship, declared to be 'a production certainly of the finest pen in America,' and was the other important state papers, and was the

chairman of the special committee which drafted the first State Constitution of N Y (1777), and the first chief-justice of the State (1777-9). He was also one of the ablest and most conspicuous of the American diplomats during the Revolutionary period.

From 1779 to 1782 he was the representative of the U S in Spain, but the Spanish government persistently refused to acknowledge the independence of the U S and never recognized Jay as a member of the diplomatic corps. In 1782-83 he was one of the American peace negotiators at Paris. To Jay, more than to any one of his associates, undoubtedly belongs the chief credit for the success of the negotiations. After his return to the United States he was secretary for foreign affairs of the Confederation (1784-9), and exerted a powerful influence, as the author, with Hamilton and Madison, of the famous *Federalist* papers and as a member of the N Y Constitutional Convention, to secure the ratification by NY of the Federal Constitution of 1787. After the organization of the new national government (1789), Jay was the first chief-justice of U S Supreme Court (1789-95). In 1794 as envoy extraordinary of the U S, though still retaining his position as chief-justice, he negotiated with the British government what has come to be known as the Jay Treaty. See JAY TREATY. He was governor of N Y, he then retired to his estate at Bedford, N Y, where he died May 17, 1829. See Johnston (ed.), *Correspondence and Public Papers of John Jay*.

**Jay, John** (1817-94), American lawyer, the son of William Jay. He was U S minister to Austria (1869-75), and became the first president of the Civil Service Commission (1883). He published *The Peace Negotiations of 1782 and 1783*.

**Jay, William** (1789-1858), American reformer, the second son of John Jay, and was judge of the county of Westchester, N Y (1823-43), was identified with the anti-slavery movement as one of the most prominent of the so-called 'Constitutional Abolitionists'. He also exerted himself in behalf of temperance reform, was one of the founders of the American Bible Society (1816). See Tuckerman's *William Jay and the Constitutional Movement for the Abolition of Slavery* (1893).

**Jay Treaty**, a treaty between the U S and Great Britain. Soon after the close of the American Revolution, relations between the U S and Great Britain became strained, owing largely to the failure of Great Brit-

ain, in contravention of the treaty of 1783, to surrender the western posts held by her or to render compensation for slaves carried away by the British troops. Moreover, while the U S was weak both France and Great Britain took advantage of her weakness and imposed burdensome restrictions on her commerce. In 1794 war with Great Britain seemed imminent, and it was largely to avert war, for which the U S was unprepared, that Washington sent Jay, then chief-justice of the U S, to negotiate a treaty. This treaty did not fully meet all the points in dispute. Nothing, for instance, was said about impressment, and the commercial clauses were unsatisfactory, but Great Britain agreed to evacuate the western posts on June 12, 1796, and arrangement was made for the settlement by commission of pecuniary claims of Americans against Englishmen, and of Englishmen against Americans. Disputed boundary questions were also to be referred to joint commissioners.

When the provisions of the treaty became known in the U S, opposition on the part of the Republicans burst forth with unexampled fury. Jay's motives were traduced and he was charged with having been corrupted by British gold, even Pres. Washington was virulently attacked, and the Republican press teemed with bitter and sensational articles. Finally, however, on June 24, 1795, the Senate ratified the treaty, with reservations as regards the most objectionable of the commercial clauses, and in the following year (May, 1796) after the House of Representatives had vainly asserted a right to share in the treaty-making power, an act was passed making appropriations for carrying the treaty into effect. The text of the treaty may be found in MacDonald's *Select Documents of United States History 1776-1861* (1898), see also the various biographies of Jay.

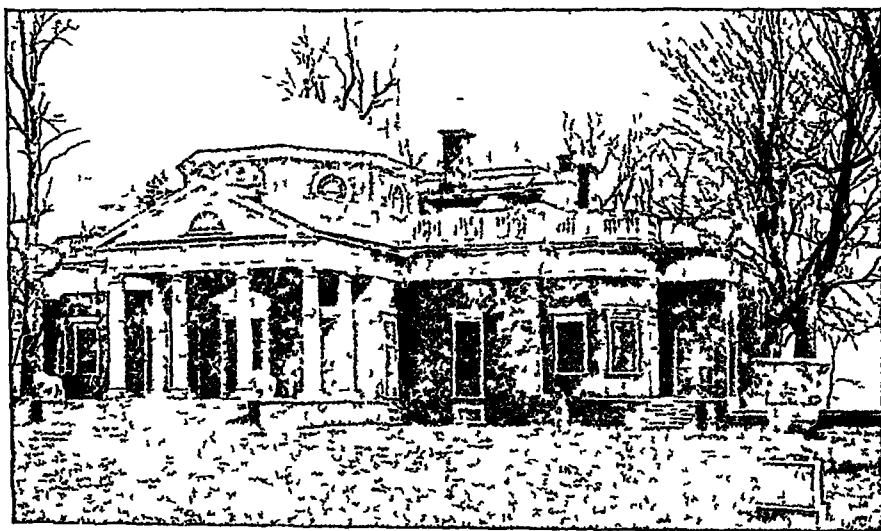
**Jeans, Sir James Hopwood** (1877-1946) English mathematician known for his method of relating mathematics to the physical sciences and is in great demand as a lecturer in England and the U S. Winner of the gold medal of the Royal Astronomical Society of England. He is a frequent contributor to leading scientific periodicals and has written *Astronomy and Cosmogony*, *Mysterious Universe*, *The Universe Around Us*, *Through Space and Time* (1934), *New World-Pictures of Modern Physics* (1936), *Eos, or the Wider Aspects of Cosmogony*, 1928, *Theory of Electricity and Magnetism*. **Jebb, Sir Richard Claverhouse** (1841-

1906), Greek scholar. He was one of the organizers of the intercollegiate classical lectures at Cambridge, and helped to found the Cambridge Philological Society, as well as the British School of Archaeology at Athens. His edition of Sophocles, with critical notes, commentary, and translation, issued in seven volumes is the standard edition.

**Jecker, Jean Baptiste** (c. 1810-71), Swiss banker whose financial claims against Mexico were partly responsible for French intervention in that country. Jecker transferred to the French government his rights in Sonora for 10,000,000 francs. After two payments Maximilian declined to pay the third

that in regular passenger automobiles, the second controls the flow of power to the front wheels, the third controls the super-low ratio, similar to that of a tractor.

**Jefferson, Joseph** (1829-1905), American actor, was born in Philadelphia. His first appearance in New York was in 1849, and in 1856 he visited London, where his great-grandfather had performed in the time of Garrick, and acted there. The following year he joined Laura Keane's stock company at her theatre in New York and made his first hit as Dr Pangloss in *The Heir-at-Law*. This character was to be one of the four or five with which his name became associated and



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Monticello, the home of Thomas Jefferson

**Jedburgh**, bor. of Roxburghshire, Scotland. It has an abbey founded by David I in 1118. A castle, built about the 12th century, was destroyed in 1409. The well-known 'Jethart justice' ('hang a man first, try him after') indicates the rough ethics of the lawless Borders.

**Jedda, Jeddah, or Jiddah**, seaport in Hejaz, Arabia, on the Red Sea. The harbor is the port of disembarkation of pilgrims for Mecca.

**Jeep**, nickname for a small half- and quarter-ton command-reconnaissance car that largely replaced the functions of the cavalry in World War II. The jeep has three levers which control its unique eight-speed gear-shift system. One is the same as

to which he practically restricted himself in later years. *Rip Van Winkle* prepared by Boucicault and himself, was so successful on its presentation in New York (1866) that Jefferson confined himself solely to this part for about thirteen years. It was not until 1880 that he produced *The Rivals* at Philadelphia with himself as Bob Acres. Thereafter he was to be seen chiefly in one of these two parts. Jefferson's *Autobiography* was published in 1890. His last performance took place at Paterson, N. J., May 7, 1904.

**Jefferson, Thomas** (1743-1826), eminent American statesman, the third president of the U. S., born on April 13, 1743, on his father's plantation, Shadwell, near his later home Monticello. His father, Peter Jefferson

(d 1757), was a man of considerable force of character and of some political prominence, his mother was a member of the somewhat aristocratic Randolph family of Va. In 1772 he married a wealthy widow, Mrs Martha Skelton. In the early controversies between the colonies and the British government he eagerly embraced the cause of the colonists. In 1775-6 and again in 1783-4, he was a member of the Continental Congress, to which he brought, said his colleague, John Adams, 'a reputation for literature, science, and a happy talent for composition'. On June 11, 1776, he was placed at the head of the committee appointed to draft the Declaration of Independence, which document, as finally adopted (July 4, 1776), was almost wholly his work. He then was again a member of the Virginia House of Burgesses (1776-9) and as such served at the head of a committee of five appointed to revise the whole system of laws of Va., in general striking at what was left of the aristocratic system of the state. From 1779 to 1781 he was the second state governor of Va.

Virginia suffered invasion at the hands of the British, Jefferson himself narrowly escaped capture. He was appointed one of the peace negotiators, but did not go to Paris, and during his second term in Congress (1783-4) he reported the definite treaty of peace, suggested what is substantially the present system of coinage, with the dollar as the unit, and drafted the ordinance of 1784 for the temporary government of the Northwest Territory. In 1784 he was appointed to co-operate with Franklin and John Adams in negotiating treaties of peace and commerce with European powers, and from 1785 to 1789 was U. S. minister resident in Paris.

As secretary of state in Washington's first cabinet (1789-93), he was constantly pitted against Alexander Hamilton, the leader of those who advocated liberal-construction and a strong central government. He was indeed the founder of the Republican, or Democratic-Republican party, of which he remained pre-eminently the leader even after his retirement from active political life. In 1796 he was the candidate of the Republicans for president, and received only three electoral votes less than Adams, thus, under the old system, becoming vice-president. In particular he strongly disapproved of the Alien and Sedition Acts, and is generally believed to have drafted the radical Kentucky Resolutions of 1798 directed primarily against these acts. In 1800 he was again the Republican

candidate for the presidency, he and Aaron Burr, the Republican candidate for the vice-presidency, received the same number of votes, the election therefore devolved upon the House of Representatives, and Jefferson, through the aid of Federalists influenced by Hamilton, was chosen. He served as president for two terms (1801-9), marked by the purchase of Louisiana (1803), by the arrest and the trial for treason of Aaron Burr, and by critical relations with France and particularly with England.

After the expiration of his last term, he retired to his home at Monticello, but retained a deep interest in public affairs. In 1819 he took the foremost part in the founding of the University of Virginia at Charlottesville, Va., of which he was architect and rector until his death, at Monticello, on July 4, 1826. In political theory Jefferson was above all else a Democrat, indeed belief in the people was almost a religion with him.

**Jefferson City**, city, cap. of Mo. It is built on high ground, and has several fine public buildings and other prominent features of interest, including Lincoln University. Its manufacturing industries include clothing, foundries, motors, and shoes. It was settled in 1822, p. 24,268.

**Jeffrey, Francis Jeffrey, Lord** (1773-1850), Scottish judge and literary critic, gave his energies to literature, especially as a contributor to the *Edinburgh Review*. Within a year after the issue of the first number (1802) Jeffrey got full control as editor. The *Review* became the leader of public opinion, and the most dreaded of critical censors. The conduct of the *Review*—Jeffrey himself did not write the article to which the poet took exception—drew from Byron his satirical piece, *English Bards and Scotch Reviewers*. It involved Jeffrey, too, in a challenge to a duel with Moore (1806), checked by the police in time, and brought about a coldness with Wordsworth and Southey, the Lake poets having been subjected to repeated attacks.

**Jeffreys of Wem, George Jeffreys, Lord** (1648-89), Lord High Chancellor of England. In July, 1685, after Sedgemoor, he conducted the 'Bloody Assize,' when 320 executions for high treason were ordered by him. Like the king himself, Jeffreys had to flee in 1688, but he was arrested, and was placed in the Tower.

**Jehoshaphat, Valley of**, identified with the gorge northeast of Jerusalem, between the Mount of the Temple and the Mount of Olives, the dry bed of the brook Kedron.

forming its lower part The garden of Gethsemane and the village of Siloam are in the valley

**Jehoshaphat**, king of Judah (c 876-851 B.C.), was the son and successor of Asa Jehoshaphat's first expedition against Moab, Ammon, etc., was attended with success, but a second against Moab was again a fiasco, as related on the Moabite stone

**Jehovah** A word which came into use in the early years of the Reformation as a representation with Roman characters of the Hebrew name of the God of Israel The name in Hebrew (written without vowels, see HEBREW LANGUAGE) consists of the consonants YHWH—the so-called tetragrammaton ('four letter-word') This passed into 16th century English as Jehovah, the distinction between I, J, and Y and between V and W being of comparatively recent date From long use and the associations which have gathered about it, it is properly considered an English word, signifying the Supreme Being and connoting especially his majesty and power The true pronunciation, as well as the origin and significance of YHWH, is now purely matter of conjecture Consult the later histories of Israel, Robertson Smith's *Prophets of Israel*, Driver's essay in *Studia Biblica*, Shultz' *Old Testament Theology*, Dillmann on Exodus, Moore's *Old Testament and Semitic Studies* (1908)

**Jehu**, king of Israel (842-815 B.C.) While as yet chief commander of the army, and during the illness of Jehoram at Jezreel, Jehu was anointed king by an agent of Elisha, and commanded to smite the idolatrous house of Omri By nature a merciless and unscrupulous zealot, he far exceeded his commission, and waded to the throne through blood

**Jehu**, a colloquial name for a coachman or driver, derived from the Biblical Jehu, son of Nimshi

**Jejunum** is that part of the small intestine which lies between the duodenum and the ileum

**Jellicoe, John Rushworth Jellicoe**, 1st Earl (1859-1935), British naval officer Shortly after the outbreak of the European War he was placed in command of the Grand Fleet, and in 1915 was created a full admiral In this capacity he was in supreme command of the British fleet at the Battle of Jutland Bank, May 31-June 1, 1916 In November, 1916, his appointment as first sea lord of the Admiralty was officially announced, in December, 1917, he retired from that office upon his elevation to the peerage

**Jelliffe, Smith Ely** (1866-1945), American neurologist, from 1907 to 1912 clinical professor of mental diseases at Fordham University, from 1911-17 adjunct professor of diseases of the mind and nervous system at the New York Post-Graduate Hospital, then consulting neurologist, Manhattan State Hospital, Tarrytown General Hospital He has been editor of the *Medical News*, associate editor of the *New York Medical Journal*, and managing editor of the *Journal of Nervous and Mental Diseases*, has edited, with W A White, *Modern Treatment of Nervous and Mental Diseases*, and written largely on similar topics

**Jelly** is a state of matter in which a liquid is solidified by the addition of a comparatively small amount of some colloid substance such as gelatin or silicic acid The best-known jellies are those composed of gelatin and water, with more or less flavoring matter, that are used as articles of food

**Jelly-Fish** (*Medusae*), a term which should be limited to the members of the subclass Scyphomedusae, of the Scyphozoa (see COELENTERATA), which includes the true medusae, or jelly-fish Of the true jelly-fish a very familiar example is *Aurelia flavidula*, often thrown up in thousands on the Atlantic beaches in August The body consists of a strongly curved 'umbrella' of jelly, whose margin is fringed with tentacles On the under surface is the mouth, in the center of four frilled lips, which bear stinging threads The special interest of *Aurelia* is its development From the fertilized egg there develops a free-swimming larva (planula), which ultimately settles down, buds out tentacles at one end, and forms what is known as a *hydra-tuba*, one-eighth to one-half inches in height Later in the season this begins to show signs of transverse fission, elongating and forming the *strobila* stage, in which it resembles a pile of saucers The top saucer falls off and floats away as an *ephyra*, and the *ephyra* grows into an adult jelly-fish

**Jena**, in, Germany, grand duchy of Saxe-Weimar-Eisenach, on the River Saale The town is well known for its famous university, founded in 1558 Among the distinguished names associated with the university and the town are those of Goethe, Schiller, Oken, Fichte, Arndt, Alexander von Humboldt There is trade in books, the famous Zeiss Optical Works are located here Lichtenhainer beer is brewed in the neighborhood, p 52,649 The Battle of Jena is often applied as a collective name to two separate

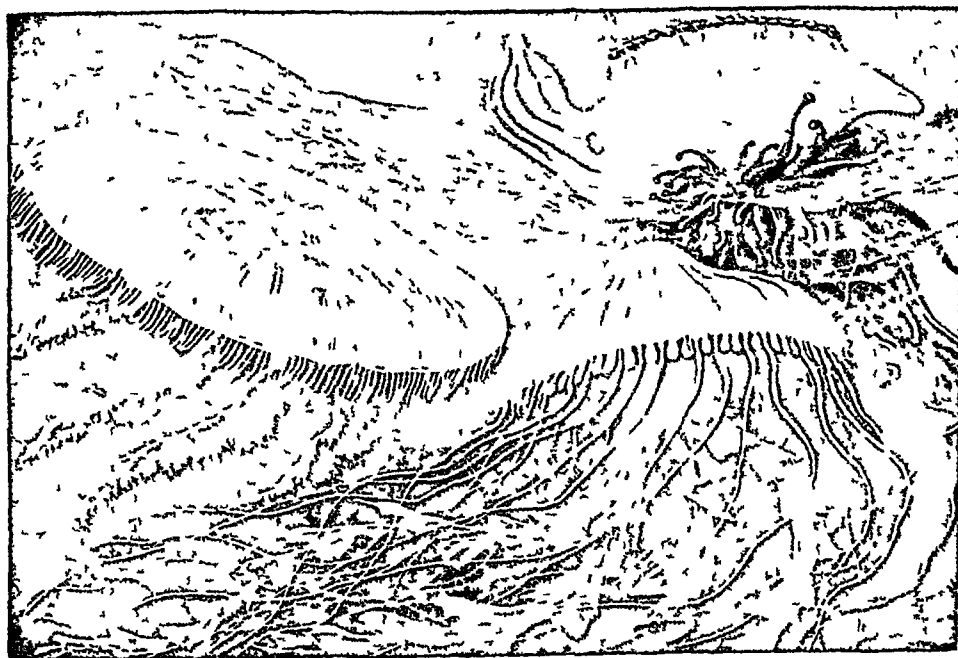
engagements fought on the same day, Oct 14, 1806, between the French and Prussians. In both the Prussians were totally defeated.

**Jenghiz Khan, Genghis Khan, or Chingiz Khan** (1162-1227), Mongol conqueror, whose real name was Temujin, was born beside the River Onon, in the n of Mongolia, the son of a Mongol chief whose sway extended over a large part of the region between the Amur and the Great Wall of China. After a stormy youth he won subjugation of the Turkish Naimans (in Western Siberia) and Ugurs (in Central Asia), the Chinese state of the Hia or Hea (1208-12), and the Tartar state of Kin in North China.

**Jenkins** See **Yenisei**

**Jenkins, Charles Jones** (1805-83), American legislator, was born in Beaufort dist, S C, and removed to Georgia in 1816. As justice of the Georgia supreme court he unsuccessfully attempted, by means of a law suit before the U S Supreme Court, to prevent Secretary of War Stanton from carrying out the Reconstruction Acts in Georgia. In 1872 he received two of Georgia's electoral votes for the Presidency, and in 1877 was president of the State constitutional convention.

**Jenkins, Thornton Alexander** (1811-93), American naval officer, was born in



*Jelly Fish*

(1212-14). Then he turned his attention to the far west, and after reducing the realm of the Mongol Kara-Khitai (in Eastern Turkestan), he overran (1218-24) Khwarezm, and Khorassan, inflicting death and torture upon thousands who dared to oppose him. Then, turning to the w, they traversed Southern Russia and penetrated to the Crimea. Meanwhile in the far east Mukul, another of his generals, had completed the conquest of all Northern China (1217-23) except Honan. See **MONGOLS**. Consult Sir H H Howorth's *History of the Mongols*, Sir R K Douglas' *Life of Jenghiz Khan*, Curtin's *The Mongols* (1908).

Orange co, Va. He became a midshipman in the U S Navy in 1828, served on the coast survey (1834-42), investigated the lighthouse systems of Europe (1845), and drafted the act of 1852 organizing the lighthouse system of the United States. He served through the Civil War, commanding the *Hartford* in the Mississippi and the *Richmond* before Mobile. He was promoted commodore (1866), and was chief of the Navigation Board (1865-69). Advanced to the rank of rear-admiral (1870), he was in command of the Asiatic station when he retired (1873).

**Jenks, Jeremiah Whipple** (1856-1929), American economist, was born in St Clair,

Mich He was from 1891 to 1912 professor of political economy and politics at Cornell University. In 1912 he assumed general charge of the department of politics and public affairs at New York University. He was expert agent of the U S Industrial Commission for the investigation of trusts and industrial combinations in the United States and Europe (1899-1901), special commissioner of the War Department to inquire into questions of currency, labor, internal taxation, and police in the Orient, special expert on currency reform for the Mexican government (1903), member of the U S Commission on International Exchange (1903-04), and a member of the U S Immigration Commission. In 1913 he was made director of the Far Eastern Bureau, and in 1918 was a member of the High Commission of Nicaragua. Professor Jenks' published works include *The Trust Problem* (1900), *Government Action for Social Welfare* (1910), *The Immigration Problem* (with W J Lauch, 1913), *The Making of a Nation* (with C F Kent, 1913), *The Testing of a Nation's Ideals* (with C F Kent, 1915).

Jenks, Joseph (1602-1683), early American inventor, was born at Hammersmith, near London, England. In 1645 he came to Massachusetts, settling at Lynn, and becoming there probably the first founder in iron and brass in the colonies. His patent for a mill invention is the first recorded in America. He made improvements in scythes and saws, and in 1652 is said to have formed the dies for the colonial ('pine-tree') coinage.

Jenner, Edward (1749-1823), English physician, the discoverer of vaccination, was born in Berkeley, Gloucestershire. In his twenty-first year he went to London to prosecute his professional studies under the celebrated John Hunter and became an expert anatomist, a sound pathologist, a careful experimenter, and a good naturalist. In 1792 he resolved to confine himself to medicine, and with that view obtained the degree of M.D. from St. Andrews. The discovery of the prophylactic power of vaccination, by which the name of Jenner has become celebrated, was the result of a prolonged series of observations and experiments. Many investigations delayed the actual discovery for no less than sixteen years, when at length the crowning experiment on James Phipps was made on May 14, 1796. This experiment was followed by many of the same kind, and in 1798 Jenner published his first memoir, entitled *An Inquiry into the Causes and Effects*

*of the Variolæ Vaccinæ*. Although the evidence accumulated by Jenner seemed conclusive, yet the practice met with violent opposition until a year had passed, when upward of seventy of the principal physicians and surgeons in London signed a declaration of their entire confidence in it. The discovery of vaccination was the precursor of the bacteriological pathology and therapy of the nineteenth century. Consult *Life and Correspondence of Jenner* by Dr J. Baron.

Jenner, Sir William (1815-98), English physician, was born at Chatham, and early began the investigations which enabled him practically to prove the difference between typhoid and typhus fevers. He attended the Prince Consort in his last illness (1861), and the Prince of Wales in a similar attack of typhoid (1871). He was president of the College of Physicians (1881-8). He published *Lectures and Essays on Fevers and Diphtheria*, 1849-79 (1893), etc.

Jennings, Herbert Spencer (1868-1947), American zoologist, born in Tonica, Ill. In 1906 he became professor of zoology at Johns Hopkins University, and in 1910 director of the zoological laboratory. He was president of the American Zoological Society (1908-09) and of the American Society of Naturalists (1910-11). Was associate editor of the *Journal of Experimental Zoology*, and has published *Behavior of the Lower Organisms* (1906), *The Universe of Life* (1933), etc.

Jennings, Louis John (1836-93), Anglo-American journalist, was born in London, England. He settled in New York in 1867, and became editor of the *New York Times*, in which he vigorously exposed the wrongdoings of the Tweed Ring and Tammany Hall. Returning to England, he became M.P. for Stockport (1885-6). Among his works are *Eighty Years of Republican Government in the United States* (1868), *The Millionaire* (1883), *Mr Gladstone a Study* (1887).

Jennings, Samuel (d. 1708), Quaker preacher, emigrated from Buckinghamshire, England, to Burlington, N. J., in 1680. As a Quaker he became involved in the controversy which provoked Keith and Budd's famous *Plea of the Innocent* pamphlet (1692). The two authors were convicted of defamation, and on appeal to London Jennings appeared there and ably refuted the statements of his accusers. On his return to Burlington he became speaker of the provincial assembly, and did much to organize the civil government.



**Jennings, Sarah, Duchess of Marlborough** (1660-1744), entered the service of the royal household, and became the intimate friend of the Princess Anne. On the accession of Anne to the throne she exercised over the young Queen a profound influence. In 1678 she was married to John Churchill, later duke of Marlborough, and she greatly promoted her husband's career. She retired from the Queen's service in 1711, and survived her husband for nearly a quarter of a century. See **MARLBOROUGH, DUKE** or Consult her *Correspondence*, Coville's *Duchess Sarah*, S. J. Reid's *John, Duke, and Sarah, Duchess, of Marlborough* (1914).

**Jensen, Adolf** (1837-79), German musical composer, born at Königsberg. Since Schumann, no one has equalled him as a composer of *lieder*. His noteworthy books of song include *Dolorosa* and *Gaudeamus*. In instrumental music he produced *Hochzeitsmusik* and *Eroticon*.

**Jephthah**, one of the judges of Israel. A native of Gilead, with a stigma upon his birth, he became the chieftain of a band of freebooters, and was made leader of the Israelite forces during the Ammonite oppression. Before the contending armies met, Jephthah made a vow before Jehovah that he would, in case of victory, sacrifice whomsoever he should meet coming forth from his house at Mizpah on his return. He routed the enemy, and as he drew near his home he was met by his only daughter at the head of a chorus of maidens coming forth to greet the victor. The vow was duly performed. Jephthah next subdued the tribe of Ephraim, envious of his glory. He judged Israel for six years.

**Jerba, Gerba, or Gerbi**, island in the Gulf of Gabes, Africa, off the southeast coast of Tunis, known in ancient times as *Meninx*, the island of the lotus eaters. Area, 425 sq miles, p. 45,000.

**Jerboa**. The true jerboa is *Dipus jaculus*, a small rodent occurring in desert regions in Arabia, Egypt, and westwards to Algeria. The head and body measure together about six and three-quarter inches, the long tail with its terminal brush of hair over eight inches. The animal habitually carries its small fore limbs pressed close to the chest, and almost hidden, the hind limbs are very much longer than the fore and bear only three digits each. See also **JUMPING MOUSE** and **JUMPING HARE**.

**Jeremiah**, Hebrew prophet, was the son

of Hilkiah, a priest. He was called to the prophetic office in the thirteenth year of Josiah's reign (c. 626 B.C.), while yet relatively young. He soon saw that the reform of Josiah was largely external, and it became his special task to proclaim the inwardness of the divine law to a people disloyal in heart. In this he encountered much opposition. Under Jehoiakim he lived in imminent danger of death, while under Zedekiah, particularly during the siege of Jerusalem by the Chaldeans, he was treated with unspeakable cruelty. When the city fell, he was kindly dealt with by the Babylonians, and permitted to retire to Mizpah, he was afterwards taken to Egypt, where, according to tradition, he was stoned to death at the city of Tahpanhes. The *Book of Jeremiah* consists largely of threatenings of judgment upon a people who had broken God's covenant, together with promises of a new and better covenant. The Septuagint version of Jeremiah seems to presuppose a very different text from the Hebrew, it is almost one-eighth shorter, and the arrangement of the material is quite different. It was probably made from a Hebrew text belonging to a time previous to the final redaction. As a religious teacher, Jeremiah was the first to emphasize the responsibility of the individual, and thus took an all-important step in the development of a national religion into a universal religion. For the *Lamentations* of Jeremiah, see **LAMENTATIONS**. Consult *Commentaries* by Ewald and Keil, Streane in the *Cambridge Bible*, Cheyne in *Pulpit Commentaries* and in 'Men of the Bible' Series.

**Jeremiah's Grotto**. See **GOLGOTHA**.

**Jérémie**, seaport, in the Republic of Haiti, on the northwestern coast. It is the birthplace of Thomas Alexander Dumas, father of the novelist, p. 5,000.

**Jerez de la Frontera**, city, Spain, in the prov. of Cadiz. Features of interest are the Alcazar, the church of San Miguel (1482), and several other churches of ancient date. Millions of gallons of sherry are produced here yearly. Originally a Roman colony, Jerez was taken by the Moors in 711, and played a prominent part in the struggle between the Christians and the Moors, p. 67,076.

**Jerez de los Caballeros**, town, Spain, in the prov. of Badajoz. It is the birthplace of Balboa, the explorer, and was a stronghold of the Knights Templars, p. 14,991.

**Jerfalcon**, or **Gyrfalcon**, or **Gerfalcon**, a group of falcons of which the Greenland

falcon (*Falco candicans*) may be taken as a type. All have slate-gray or white plumage.

**Jericho**, ancient city of Palestine, in the valley of the Jordan, 15 miles northeast of Jerusalem. It was miraculously destroyed by Joshua, who under pain of anathema forbade any rebuilding of it. The territory was given to the tribe of Benjamin, and five centuries later the town was rebuilt by Hiel of Bethel. The Jericho of Roman times, referred to in the New Testament, was somewhat farther S., the Jericho of the Middle Ages, on the present site of El Ribā, was farther to the E. In the last quarter of a century extensive excavations have been undertaken at Jericho. The probable site of the Canaanite city has been laid bare, and ruins of the Hellenistic Jericho have also been excavated. The city was occupied by British troops, Feb. 21, 1918.

**Jeritz, Maria** (1891- ), Austrian operatic singer, was born in Brunn. In 1913 she became a member of the Vienna Hofoper and in 1921 made her first appearance in the United States, as Marietta in *The Dead City*. She has a voice of great power and beauty, and is a brilliant actress. Among her best roles are *Michael*, *Tosca*, *Saintuzza*, *Elza*, *Aradne*, and *Octavian*.

**Jeroboam I**, first king of Israel—the northern kingdom (B.C. 937-915)—was the son of Nebat. He was an administrator of taxes under Solomon, and after that led the popular revolt against Rehoboam's oppressive policy, eventually becoming king of the ten northern tribes. Having restored Shechem and made it his capital, he established sanctuaries at Bethel and Dan. Towards the end of his reign he sustained a crushing defeat at the hands of Abijah of Judah.

**Jeroboam II**, king of Israel (c. 790-749 B.C.), was the son and successor of Joash. He restored the coasts of Israel, and 'recovered Damascus'.

**Jerome**, whose full name was *SOPHRO- NUS LUSEBIVS HILTONIVS*, one of the greatest of the Latin fathers, was born of a Christian family at Stridon, a frontier town between Dalmatia and Pannonia, (c. 346 A.D.). In early youth he went to Rome, then to Aquileia, in furtherance of his studies, thence to the East. He became a presbyter at Antioch, resided for a while at Constantinople, and in 382 returned to Rome and became secretary to Bishop Damasus. Jerome left Rome in 385, and in the following year settled at Bethlehem, where he founded a monastery, chiefly

through the beneficence of a Roman lady named Paula, who likewise founded a convent for women. Here Jerome labored for thirty-four years, completing his translation of the Bible, and here he died 420 A.D. He is usually reckoned the pre-eminent scholar of the Western Church.

**Jerome, Jerome Klapka** (1859-1927), English author, was born in Walsall. In 1888 he published *On the Stage and Off*, followed by *Idle Thoughts of an Idle Fellow* (1889), and *Three Men in a Boat* (1889), the abounding humor of which won him a wide reputation. Among his other publications are *Tea-Table Talk* (1903), *All Roads Lead to Calvary* (1919), *Anthony John* (1923), and numerous plays including *The Passing of the Third Floor Back* (1907).

**Jerome, William Travers** (1859-1934), American lawyer and political leader, was born in New York City. He was justice of Special Sessions from 1895 to 1902 and was elected district attorney of New York county on the Reform ticket with Seth Low in 1901, being re-elected by a large plurality in 1905, despite the opposition of machine politicians.

He became widely known as the prosecutor of Harry K. Thaw for the murder of Stanford White, architect. In later life he aided financially in the development of colored motion pictures.

**Jerome Bonaparte**. See *Bonapartes*.

**Jerome of Prague** (d. 1416), friend of John Huss, was a native of Prague. When Huss was taken prisoner at Constance, Jerome hastened to defend him, was himself seized and imprisoned, recanted his heresies, and finally, having withdrawn his recantation, perished at the stake at Constance, on May 30, 1416.

**Jerrold, Douglas William** (1803-57), English dramatist, journalist and author, was born in London. He achieved a brilliant success with his piece *Black-eyed Susan*, which was played four hundred times in 1829. Other plays were *The Devil's Ducat* (1830), *The Bride of Ludgate* (1831), and *Time Works Wonders* (1845). As a contributor to *Punch* Jerrold was in his element, in it appeared his *Q. Papers*. He edited Lloyd's *Weekly Newspaper* (1852-57). Among his works which are marked with more seriousness against current evils are *The Story of a Feather* (1844), *The Chronicles of Cloverbrook* (1846), and *A Man Made of Money* (1849). His collected works were published in 1851-4 and in 1863-4. Consult *Life* by W. Blanchard Jerrold.

**Jerrold, William Blanchard** (1826-84), English author and journalist, son of Douglas Jerrold, was born in London. His publications include the farce, *Cool as a Cucumber* (1851), which achieved marked success in London, *Beau Brummel* (1858), *The Chatterbox* (1857), and sketches of great writers, entitled *The Best of All Good Company* (1873), also novels and many other books.

**Jersey**, largest of the Channel Islands, belonging to Great Britain, has an area of 45 sq miles and a population of 50,455, mostly of Norman extraction. It lies about 15 miles from the coast of Normandy, 95 from Weymouth, and 130 from Southampton. The coasts are rock bound, and contain several safe bays. St. Helier is the chief port. The inhabitants grow vegetables for the English market, and breed a valuable and widely celebrated race of small milch cows (see **CATTLE**). Jersey governs itself by means of an assembly (the 'States'), partly elected, partly *ex-officio* members. It was seized by Germany, 1940.

**Jersey City**, city, New Jersey, county seat of Hudson co., second city of the State, and New York's most important suburb, is situated on a peninsula between the Hackensack River and Newark Bay on the w. and the Hudson River and New York Bay on the e. and southeast, opposite New York City. Jersey City covers an area of 12,288 acres, the main business and industrial section occupying the low-lying eastern portion of the peninsula, and the residential section occupying the higher ground to the w. By virtue of its location and its splendid transportation facilities, Jersey City is a commercial center of prime importance. It is the *entrepôt* of a large trade, especially in iron, coal, and agricultural produce, and accommodates shipping interests comparable in volume to those of New York City. Chief among the manufactured products are iron and steel products, locomotives, boilers and machinery, heating apparatus, planing mill products, sugar, tobacco, motion picture films, railroad cars, boxes, electrical and scientific instruments, chemicals, oakum, crucibles, and brass, copper, and zinc goods. Slaughtering and meat packing are of great importance, and there are large grain elevators, p 301, 173.

The site of Jersey City, formerly known as Paulus Hook, was settled as early as 1633. In 1779 it was the scene of a brilliant exploit by 'Light Horse Harry' Lee, who with 200 men descended on the British there sta-

tioned, captured the garrison of 160 men, and demolished the works. The city was mapped out in 1804, incorporated as 'City of Jersey in the County of Bergen' in 1820, and as Jersey City in 1838. The township of Van Vorst was added in 1851, Bergen and Hudson City in 1870, and Greenville in 1873. Consult H. P. Eaton's *Jersey City and Its Historic Sites, Jersey City of To-Day* (2d ed., prepared by the Chamber of Commerce, 1910).

**Jerusalem**, chief city of Palestine, and the ancient capital of the Jews, is situated in Southern Palestine. The city stands upon a plateau of limestone rock which mounts to the watershed in the northeast, and is divided toward the s. into two rocky promontories separated by the Tyropæon Valley (El Wâd) running e. and s. through the city. On the e. of the two heights is the Kidron Valley or Wâdî Sitti Mariam, beyond which lies the Mount of Olives, while to the southwest is the Valley of Hinnom or Wâdî er-Ribâbî. These three valleys, formerly deep ravines, but now nearly obliterated in many parts by accumulated *débris*, converge s. of the city near the Pool of Siloam, to form the Wâdî en-Nar, which drains the district toward the Dead Sea. The climate of Jerusalem is on the whole temperate and healthful. The inner city is surrounded by a wall of hewn stone, erected by Sultan Soliman the Magnificent about 1540. The Jaffa Gate on the western side forms the principal entrance to the city. Within the walls the town is divided into four quarters—the Armenian in the southwest, the Jewish in the southwest, the Moslem in the northeast, and the Christian in the northwest. In recent years a number of suburbs have sprung up outside the city walls. The most notable is the Jaffa suburb, headquarters of the European population.

The chief interest of Jerusalem lies in its association with the life and death of Christ, and its earlier history as the religious and political center of Israel. The heart of the city to the Christian believer is the *Church of the Holy Sepulchre*, which occupies the reputed site of the crucifixion (see **CALVARY**), and is said to contain within its walls the actual tomb in which the Saviour's body was laid. The earliest edifice to mark the site was consecrated in 336, and destroyed by the Persians in 614. Later buildings were burned or suffered at the hands of the Moslems, and the present structure dates from 1810, though it contains portions of the Romanesque

church erected by the Crusaders in the early twelfth century. To the Moslem the most sacred spot in the city is the Haram esh-Sherif, or place of the Temple, the site of Solomon's Temple and of the later Temple erected by Herod. See **TEMPLES**.

Jerusalem is the seat of Roman Catholic, Armenian, and Greek patriarchs, and of an Anglican bishop, and has a large number of churches, synagogues, monasteries, and other religious and philanthropic institutions. The present population is estimated at about 90,407. The industries of the modern city are limited to the production of articles of mother of pearl and of carved olive wood, which are sold as souvenirs to pilgrims and tourists, and exported in considerable quantities.

The history of Jerusalem covers a period of about 3,500 years, its first mention being in the Tell-el-Amarna tablets, which reveal that as early as the fifteenth century B.C. there was an important town on the present site tributary to Egypt, and known as *Urusalim*. It was eventually taken by David about 1,000 B.C., when its real history may be said to begin. Having captured the city, David occupied the citadel of Mount Zion on the eastern hill, s of the present Temple area, erected fortifications, and brought hither the Ark of God, making the new capital the political and religious center of his dominions. His son and successor, Solomon, erected a magnificent group of buildings, including the Temple to Jehovah (see **TEMPLES**) and the Royal Palace n of the palace of David. Jerusalem suffered a serious political decline with the revolt of Jeroboam and the Northern tribes. It was attacked successively by Shishak, king of Egypt (c. 935 B.C.), by the Philistines and Arabs (c. 850 B.C.), and by Joram of Israel (786 B.C.). In 701 B.C. Sennacherib laid siege to Jerusalem, but was forced to withdraw. A hundred years later Nebuchadnezzar occupied the city, carrying into captivity the royal family, the court, and many of the population, and in 586 B.C. the town was sacked, and the Temple and Palace burned.

Jerusalem remained a city of desolation until 536 B.C., when a body of exiles returned under the leadership of Zerubbabel and began the construction of the second Temple, completed in 515. Ezra established the law, and Nehemiah rebuilt the wall and Jerusalem again became the shrine of Israel. In 33 B.C. Alexander the Great added Palestine to his dominions, and the city suffered severely in the struggles subsequently to his death.

(327) Antiochus Epiphanes occupied it in 168 B.C., destroyed its fortifications, desecrated the Temple, and massacred the population. Under the leadership of Judas Maccabæus the Jews marched upon Jerusalem, occupied the Temple Hill, and restored the Temple in 165 (See **MACCABEES**). In 63 B.C. Jerusalem was taken by Pompey, and in 37 passed to Herod, who repaired the fortifications, built a palace, and began the erection of the third Temple, closely associated with the life and teachings of Christ. A subsequent revolt brought the Roman legions to the city walls, and after a siege of 143 days Jerusalem fell to Titus (70 A.D.). In 134 the rebellion of Bar-Cochba was the signal for another devastation. In 136 Hadrian rebuilt the city, called it *Acha Capitolina*, and generally paganized it.

The early centuries of Christianity were for the most part a period of peace for Jerusalem. The city gradually assumed a Christian character, monasteries, churches, and hermitages were erected, and pilgrimages were undertaken to the scenes of gospel history. In 614 the city was attacked by the Persians, who destroyed many of the buildings, and in 637 it passed under the power of Islam. When the Seljuk Turks came into power (1077) their oppression of the pilgrims became a challenge to the Christian powers, and the Crusades were the result. Godfrey of Bouillon rescued the city in 1099, and established the Latin kingdom of Jerusalem, which endured until 1187, when the famous city was retaken by Saladin. From 1247 to 1517 it was subject to Egypt, when it again fell into the hands of the Turks. In 1825 there was a partially successful revolt against the Turkish despotism, but in 1840 the authority of Turkey was confirmed by the powers. On Dec. 9, 1917, after centuries of practically undisputed possession by the Turks, Jerusalem surrendered to the British Army in Palestine under the command of General Allenby, and came once again under Christian domination. By Christ the world over the news of the surrender of Jerusalem was received with rejoicing that the Holy Land was once again delivered from the hands of the Turk, while by Jews it was looked upon as a great forward step in the Zionist movement for the establishment of a Jewish state in Palestine. See **ZIONISM**, **ISRAEL**, **JEW**, **TEMPLE**.

**Bibliography.**—Consult the Old Testament for the history of Jerusalem to the destruction of the city by Titus. Consult also War-

ren and Conder's *The Survey of Western Palestine, Jerusalem, Annual Reports of the Palestine Exploration Fund*, A Goodrich-Freer's *Inner Jerusalem*, G A Smith's *Jerusalem from the Earliest Times to A D 70* (2 vols, 1907-08), L B Paton's *Jerusalem in Bible Times* (1908), C R Conder's *The City of Jerusalem* (1909), C M Watson's *The Story of Jerusalem* (1912), Farmer's *We Saw the Holy City* (1944)

**Jerusalem Artichoke** (*Helianthus tuberosus*), the tuberous root of a native of N America, where it was cultivated by the Indians. See **ARTICHOKE**

**Jerusalem Chamber**, a room in Westminster Abbey (see **WESTMINSTER**), is ascribed to the period of Henry III (1207-72), and received its name from a set of tapestries depicting the history of Jerusalem

**Jerusalem Cherry** (*Solanum pseudocapsicum*), a small shrub, which may reach four ft in height, but which is usually smaller when used as a pot plant. It has shining green, entire leaves, and scarlet or yellow globular fruit

**Jerusalem Corn**, a variety of sorghum

**Jerusalem, Temple of**. See **Temple, Jerusalem**

**Jervaulx Abbey**, a ruined Cistercian abbey, built on the plan of Fountains Abbey, North Riding, Yorkshire, England. It was founded in 1156. Prior Aylmer (see Scott's *Ivanhoe*) belonged to this abbey

**Jervis, John Bloomfield** (1795-1885), American engineer, was born in Huntington, N Y. He supervised the planning of the Delaware and Hudson Canal, and served as chief engineer of numerous railroads and important undertakings, including the Croton Aqueduct (1836-43) and Cochituate Aqueduct, Boston, and the construction of the Hudson River Railroad between Albany and New York. He published *Labor and Capital* (1877), etc

**Jervis Bay**, Vincent co, New South Wales, 90 miles southwest of Sydney, is one of the safest and most commodious harbors in the world. Its length is about 10 miles and width 2 miles (at entrance) to 10 miles

**Jessamine**. See **Jasmine**

**Jesse, John Heneage** (1815-74), English historical writer, son of Edward Jesse, was a clerk at the Admiralty. His first historical work, *Memoirs of the Court of England during the Reign of the Stuarts* (1840), met with appreciation, and was followed by *Memoirs of the Court from 1688 to the Death of*

*George II* (1843), *Memoirs of the Life and Reign of King George III* (1867), etc

**Jest Book**. Many current stories and jests can be traced back through the monkish *raconteurs* of the Middle Ages to the East. Collections of jests and humorous stories may be either avowed compilations, extracted from literature, history, tradition, and experience, but they are frequently fathered upon some notorious local or national jester. Among such jest books are Tarlton's *Jests a Hundred Mery Talys* (first extant ed 1611), to which reference is made in *Much Ado about Nothing*, and Joe Miller's *Jest Book, or the Wits Vade Mecum* (1739). These, however, are only a few of the vast number of jest-books, a type of literature to be found in nearly all countries, and which prepared the way for the realism of the modern novel. See W C Hazlitt's *Shakespeare's Jest-Books* (1875)

**Jester** is properly a teller of *gestes* or heroic deeds (*gesta*). But in the decay of minstrelsy a *geste* came to mean a witty story or sally, and a *gestour* such a domestic fool or buffoon as great personages were wont to keep for their private entertainment. As a court institution the fool does not seem to have outlived the commonwealth. The earliest fools were probably real 'naturals,' or half-witted folk, in later cases the folly was mainly assumed, and served as a cloak for plain-speaking and ribaldry. The traditional get-up of the court fool, the parti-colored garments, the hood with cocks-comb and asses' ears, the bauble or *marotte*, was probably borrowed in the 14th century from that of the so-called Feast of Fools. See F Douce's 'Clowns and Fools of Shakespeare,' in *Illustrations of Shakespeare* (1839), J Doran's *History of Court Fools* (1858), E K Chamber's *Mediæval Stage* (1903)

**Jesuits, The, or Society of Jesus**, for which the letters S J are commonly used as an abbreviation, are a religious order founded by Ignatius Loyola in 1534. Like other religious orders, the members are bound by the three religious vows of poverty, chastity, and obedience, and their rule of life is more or less exactly laid down in a written code of 'constitutions' approved by papal authority. The society found its special work in trying to stem the rising tide of Protestantism, and is closely identified with the counter-reformation. The members of the society are divided into priests, scholastics, lay brothers, who do the work of the houses, and novices, who are as yet bound by no vows. Very great

power is vested in the head of the order, the 'father general,' who is elected for life, but his power is in practice controlled by a small council of five assistants, who represent respectively, the Italian, Spanish, German, French, and English-speaking groups of 'provinces.' Each province is ruled by a provincial, and the provincials and rectors, or heads of all the more important colleges and residences, are appointed by the general.

Three forms of activity are singled out as specially proper to the institute—viz the work of teaching the young, preaching to the ignorant and the heathen, and guiding Christians in the 'way of perfection.' The Jesuits may be said to have been the first of the distinctively educational orders, and they have always attached special importance to missions to the heathen. The development of the society was rapid. At the death of its founder in 1556 it numbered rather more than 1,000 members, divided into twelve provinces. Nine years later, when the third general was elected, the numbers had risen to 3,500, in 18 provinces. Huge day schools like the Collegio Romano, which in 1584 numbered over 2,100 students, spring up in every province, and during the 17th and 18th centuries the pupils in the secondary schools conducted by the Jesuit fathers probably reached on average of 210,000 annually (See Schwickerath's *Jesuit Education*, p. 144, 1903).

St Francis Xavier, the companion of Ignatius, preached the gospel with extraordinary success in the remotest parts of India and Japan. In the southern hemisphere the dream of a Christian Utopia seemed to many to be realized in the famous Jesuit 'reductions' of Paraguay (see Cunningham Graham's *A Vanished Arcadia*, 1901), while it would be hard to find a parallel to the heroism of such missionaries as Fathers Brebœuf and Jogues in preaching to the North American Indians. Upon this, see, for example, F. Parkman's *The Jesuits in North America* (new ed 1901), and Thwaites's *American edition of the Jesuit Relations* (1896, etc.).

In their more controversial labors the Jesuits have generally appeared as the champions of papal authority in the form which would now be described as ultramontanism. They have, at one time or another, been expelled from almost every country in Europe, and towards the close of the 18th century a coalition of the powers under Bourbon influence brought pressure to bear upon the reigning Pope Clement XIII, to secure the suppres-

sion of the order. This was accomplished by the brief *Dominus ac Redemptor Noster*, July 21, 1773. In Russia, however, where the brief could not be published, a few Jesuits still hung together. Their continuance was formally sanctioned by Pius VI in 1801, and his successor, Pius VII, in 1814 restored the society throughout the world. At the present day, though the order is banished from Germany and dispersed in France, it numbers about 21,000 members. It maintains important universities and colleges in the United States, among which are those of Georgetown, Fordham and Holy Cross, Worcester. See the comprehensive narrative of Cretineau-Joly, *Histoire de la Compagnie de Jésus* (6 vols 1844-46), or its English summary by B. Neave, Campbell's, *The Jesuits 1534-1921* (1923), La Farge's *The Jesuits in Modern Times* (1928).

**Jesuits' Bark.** See *Cinchona*.

**Jesup, Morris Ketchum** (1830-1908), American philanthropist, born in Westport, Conn., was engaged in the banking business in New York in 1852-84, became president of the American Museum of Natural History in 1881, and of the Chamber of Commerce in 1899, both in New York, and retained both offices till his death. He was also president in 1881-1903 of the New York City Mission and Tract Society, for which he built the DeWitt Memorial Church. He gave the Union Theol Sem the building known as Jesup Hall, and was a liberal patron of charitable, scientific, and educational institutions. To the Museum of Natural History he gave much in life and bequeathed \$1,000,000.

**Jesus Christ.** The material for a biography of Jesus may be found in the four gospels. Of these, the second and the third are commonly believed to have been written by men who gathered their knowledge from eyewitnesses, the first is supposed to embody the work of Matthew, one of the companions of Jesus and the fourth according to an important section of scholarly opinion, was written either by or practically at the dictation of John, the closest friend of Jesus. According to these authorities, then, and upon the lines already indicated the life of Jesus may be sketched thus:—He was born in Bethlehem, a village of Judæa, four years (according to others seven) before the date reckoned as the beginning of the Christian era. The national conditions into which He entered were unsound, both politically and religiously. Politically the Jews were subject to Rome. Among the great

majority of the people the Roman rule was very unpopular, and the old national spirit concentrated itself in a passionate desire for and occasional efforts after freedom. There were, however, two sections of the nation whose main interest ran in other directions. One of these was the party of the Sadducees, whose preoccupations were political, rather than religious. The other party was that of the Pharisees who were much more concerned with religious than with political issues. Formalism had frozen religious life as expressed in the dominant religious caste, and all the evils attendant on the existence of such a caste were being felt to the full. But among all these adverse conditions there was left a 'righteous remnant' who waited humbly for some visitation of Jehovah which should redeem His ancient people from tyranny of the stranger, and set up once more in the holy city a religion pure and undefiled. Such, very briefly, were the forces at work in the nation while Jesus was growing up at Nazareth. Only one episode is recorded of His childhood. At the age of 12, on his memorable first visit to Jerusalem, He remained in the temple questioning the doctors of the law when His parents had started homewards to Nazareth with their company. And his single question in answer to their reproaches, 'Wist ye not that I must be about my Father's business?' betrayed a sense of a mission which might at some future time claim the right to absorb His life. He went down with His parents to Nazareth, 'and was subject unto them,' and, adds St. Luke, He 'increased in favor with God and man.' Beyond this, there is no record of Him until, at the age of 30, He came suddenly before the public eye. The time was one of moral awakening, and thousands were drawn out into the wilderness by the preaching of John the Baptist. The crowds who responded to his appeal accepted baptism in the Jordan as the seal of their new endeavor, and among the crowds came Jesus. But when He came forward with the rest, John hesitated. He held Jesus to be that greater One whose coming he had foretold, and the latchet of whose shoes he was not worthy to unloose. Yet he yielded to the request, and Jesus was baptized. On this day Jesus received what was felt to be a direct gift and recognition from on high, which confirmed in Him the sense of His mission. There is no question that from the first His one idea was to use His powers in the service of righteousness, of that compelling ideal which was not external

to, but one with, His inmost soul. But there faced Him the inevitable temptation of expediency. Should these weapons be used in the obvious ways—to save His own life for the sake of His cause, to bring the people into the service of that cause by the exhibition of wonders, or to work out the immediate triumph of that cause by the exercise of whatever means, physical or spiritual, presented themselves as most opportune? The story comes to us, as He must have told it, in parable, and it is probable that it could have been told in no truer way. Enough is there to show that then He finally chose that line from which He never afterwards swerved, and which represents the revolution which He effected in human ideals. In that time of sorrow was born the central and distinctive idea of Christianity, the idea of victory through service and not through the assertion of the self, and the determination to renounce the help of physical forces, and to commit the issues to the sphere of the spirit only, even to the acceptance of apparent defeat. These were the lines upon which His whole mission was pursued, and in the pursuit of which He went deliberately to death. The first notable step in preparation for His public work was the summoning by Jesus of the men who were to be His companions in it. According to St. John, those who first joined Him—*viz.* Simon and Andrew, probably also James and John—while followers of John the Baptist, had had some intercourse with Jesus. Nevertheless the fact that at His call they left their nets and went to share His life points to some singular compelling attraction and dignity in Jesus, an attraction which must also have been at work in the case of Levi or Matthew, who left his money-making at the call of a penniless Jew. And these cases were probably representative of the way in which the other disciples joined their fortunes to His. He inspired a very strong personal love, and, more than this, He represents to these His followers the embodiment of the highest which they had yet seen, a spiritual force which gradually took shape in their minds as being a revelation of God Himself. The people saw in Him a new prophet who could only be explained as the reincarnation of Elijah or Jeremiah. But, besides this, they knew Him as one who would turn aside to cure any human ill, great or small, that He could touch, who cared for children and other weak things of the earth, and even exalted them, and to whom nothing human was alien. And because holi-

ness and the concomitant harmony with God seemed to Him the supreme good, his effort to help was often concentrated on the patting of the soul in a position to reach this good. But the aspect of Jesus as less comprehensible to the populace than His aspect as a healer of physical ill, or as possible saviour of the nation, and it was to His increasing emphasis upon it that the desertion of the people before His death may be traced. The conviction that in His own person He could supply all the world's need and that all power in heaven and in earth was His, set strangely with the surrender of the ordinary interests of the self. But it was not hand in hand with a great personal courage and a power to command to a high

of the priestly class and began to turn the drama towards its tragic conclusion.

The time of Jesus' public ministry from the call of the apostles to His death covered a period of three years, or according to a different view, of two years and a few months. It falls in any case, between the spring of A.D. 30 and the Passover of A.D. 33 and it was spent mainly in Galilee, with a journey into the region of Tyre and Sidon, and visits to Jerusalem. His record shows on the one hand constant labor both in teaching and in healing; and on the other, frequent collisions with the Scribes and Pharisees. His persistent exaltation of the spirit and comparative neglect of the form was the underlying cause of their enmity towards Him, which



C. Lewis Gallows

*The Garden of Gethsemane as it today*

our modern conception of Jesus, and more especially the artistic conception, does great injustice. To it He is only the 'Man of sorrows,' or the lover of children, the forgiver of the sinning, the comforter of the sad. But it was not in such a character that, single-handed, He drove the money-changers from the temple, it was not a person lacking in virility whom a furious mob in Galilee could not summon courage to touch, but who, 'passing through the midst of them, went His way,' or who, standing in peril of death, could occupy Himself with the effort to make Pilate assert himself truthfully and play the man. It was this claim to authority and actual assertion of it, together with the more transcendent claim which later in His ministry He publicly advanced, that roused the anger

blazed out on occasions when, as in performing works of healing on the Sabbath day, He ran counter to their dearest traditions. An attitude so defiant, and at the same time so hard to cope with, could not go unpunished. But while the Pharisees were nursing their wrath against Him, His work went on unhindered. His method of teaching the crowds who followed Him was mainly the method of parable, as that appealing most effectively to the general mind. His whole body of teaching, though a unity scarcely admitting of division, may be considered under a few of its ruling ideas.

Chief among these was his conception of The Kingdom of Heaven, which represented something which to possess was infinite gain, and to miss was infinite loss. From the indi-



vidual point of view this 'pearl of great price' may be expressed as a progressively realized harmony between the soul and God. But the 'kingdom' had also its denotation, covering a society whose members should share that harmony, and which should become a very 'kingdom of God' on earth. He also emphasized God's attitude toward man as being one of Fatherhood. To God the individual is of unmeasured worth, like the single sheep that has strayed from the flock, he is sought until he is found. Finally, man's responsibility both to God and to his fellow men was constantly emphasized in the teachings of Jesus. He Himself described man's whole duty in its twofold bearing as implicit in this double commandment: 'Thou shalt love the Lord thy God with all thy heart, and with all thy soul, and with all thy mind; and thy neighbor as thyself.'

Side by side with His teaching, the records give a history of miraculous works performed by Jesus. Discussion of the various hypotheses offered in explanation of the miracles of Jesus is here impossible. But it may be questioned whether an adequate explanation of these miracles in the terms of modern knowledge is of the first importance. The significance of Jesus to the world has developed so greatly on lines with which science has nothing to do, that it is not apparent that a scientific explanation of His miracles would in any substantial way affect His influence over men. Only one more of the points most prominent in the record can be noted. In studying the question of His inner life one conclusion emerges with convincing force. He depended for stimulus and for strength upon times of withdrawal into lonely places, where, it is recorded, He prayed. This was His refuge in all the crises of His life—e.g. at the time of His farewell to His disciples, and immediately before His arrest. Those of His prayers which find a place in the narrative show a sense of oneness with God unknown in the records of prayer, and, parallel with this, an absence of the sense of smallness, of imperfection, which is likewise unknown.

The last stage of that history of which the foregoing is only a bird's-eye view moved with swift certainty to its close. The story of His last weeks is filled with characteristic work and teaching. Among the incidents noted are the healing of a blind man, the interview with the young ruler, who could not bring himself to the renunciation of his earthly goods, and with Zacchæus, who in

great measure made that renunciation, the driving of the money changers from the temple, and the incident of the widow's mite. In this period was included also the raising of His friend Lazarus from the dead, an incident the noise of which went far to confirm the Sanhedrin in their intention of putting Jesus to death.

Three days before His arrest the popular enthusiasm flickered up suddenly and for the last time. The crowds who had assembled for the feast went to meet Him as He rode into Jerusalem, carrying palm branches and crying 'Hosanna,' as in honor of a king. But the flame sank as quickly as it had arisen, and it was in the company of His friends alone that He spent His last days. The net was being drawn closely round Him, and He knew it, after Judas had made his bargain with the priests, nothing but recantation or flight could have saved Jesus. He told his disciples that His separation from them would not be final, rather that His union with them would be even closer after His death, for He would come to them anew, and, more than this, the very spirit which had dwelt in Him should dwell in them. Their last meal together was to Him symbolic in its elements of the coming sacrifice of His life. He went voluntarily to His death, speaking of it prophetically, moving towards it in an unswerving line, and facing it as one who was giving His life 'a ransom for many.' This aspect of His death was taken up by His followers—by St. Peter, and with especial force by St. Paul—and for the early church it was full of the highest significance. And throughout the ages the church has striven to express, in forms that have changed with thought, this idea which Jesus, with His unerring religious instinct, enshrined for ever in symbol.

After the supper He went with His disciples to the garden of Gethsemane. Though he clearly looked beyond His death to the triumph of His cause, there was at this time a great darkness upon His spirit. His arrest by the officers of the temple, led by Judas, took place in the same garden. He was led to the palace of the high priest, and there underwent the first part of His trial. He was examined, according to the synoptists, by Caiaphas, the high priest, and according to St. John, first by Annas, late high priest and father-in-law of Caiaphas, and then by Caiaphas himself. The facts that the examination was conducted at night, that at first it was, if only for that reason, not fully public, that it preceded the production of wit-

nesses, that, on the insufficiency of the evidence first heard, the charge was not dropped, and that no witnesses were called for the defence—were all, there is reason to believe, infringements of the Jewish law, and strengthen the suspicion that the death of Jesus was predetermined by the high priest. The crime of which Jesus was accused was His claim to be the Messiah and the Son of God, with, apparently, a subordinate charge of hostility to the most venerable institutions of the nation. His answer to the high priest's question, 'Art thou the Christ, the Son of the Blessed?' was without hesitation in the affirmative. 'I am, and ye shall see the Son of man sitting on the right hand of power, and coming in the clouds of heaven.' This assertion, which stirred the anger of the assembly, and was declared by Caiaphas to be blasphemy, was a deliberate step on the way to death. Condemning Him with one consent, they carried Him to Pilate, the Roman procurator, in whose hands lay the final passing of the death sentence.

To gain from Roman justice the desired capital sentence, it was necessary to alter the charge against Jesus to that of treason towards the emperor Pilate, after a fruitless attempt to transfer the responsibility of the sentence to Herod, tetrarch of Jesus' native province, examined Jesus as to the nature of His claim to kingship. Jesus explained that it was a kingdom 'not of this world.' Pilate found no treason there, and would have released Him. But the pressure put upon Pilate was strong. To the end Pilate maintained the innocence of Jesus, and when he finally yielded it was clearly under the pressure of fear. His sense of justice gave way before it, and Jesus was condemned to be crucified.

The history of the six hours during which Jesus still lived upon the cross does not lend itself to brief description. That night His body lay in a tomb belonging to Joseph of Arimathea, a Pharisee, who was yet one of His disciples, and the little group who stood near the cross had seen the end of all their hopes. The way in which those hopes were rekindled is of great interest. On the morning of the second day following the death of Jesus, several of His friends had experiences of a wholly unexpected kind. The narratives do not agree as to the exact form and order of these experiences, but from them the following essentials may be gleaned. Early in the morning certain women, among whom was Mary Magdalene, reported the

tomb of Jesus empty, and called Peter and John, who visited it and confirmed their testimony. More than this, Mary Magdalene met in the garden one whom not immediately, but in the course of conversation, she recognized to be Jesus. The same day two of His disciples, going to Emmaus, were joined by one whom in the same way they knew after a time to be Jesus. At right a company of the disciples, assembled within closed doors, saw Jesus, who stood among them and entrusted to them new powers and a new commission. Eight days later He appeared to them again, and convinced Thomas, who had not been present on the last occasion, that it was indeed Himself whom they saw. Another appearance of Jesus to His disciples by the Lake of Galilee seems to have had as its especial object the renewal of the friendship which Peter had so tragically betrayed when, in the hall of Caiaphas, he denied Him thrice.

Two of the biographers of Jesus record in their closing words His farewell charge to His disciples, and His ascension into heaven, after which He was seen no more by them on earth. The appearances of Jesus after His death have been in all ages a main subject of study and discussion. Of all the considerations which must be taken into account in such study, two only can be very briefly indicated here. First, the experiences were shared by persons of widely different temperaments, and sometimes by considerable numbers at the same time. Secondly, within a few weeks after the death of Jesus, His disciples suddenly exhibited a courage and a spiritual vitality unknown to them before, they began to sway men, and to carry everything before them, somewhat after the manner of their Master. The change is remarkable enough to demand explanation, and in seeking it, the testimony of those in whose consciousness it took place claims at least examination.

The birth of Jesus, as being the result, not of ordinary physical process, but of Divine agency, was widely received among the early Christians, and has passed into a tenet of the church. It is given by two of the four biographers but not by Mark, the earliest and most realistic of the evangelists, and should be examined in the light of the fact that it may be related, not as a proof of the supernatural character of Jesus, but as an explanation of a personality which was felt to need explanation. Finally, this claim to a Divine character has been the foundation stone or

the Christian Church, and the history of that church cannot justly be considered apart from it. That history is one of many thousands of minds in all ages to whom Jesus has



Photo by Elmendorf, © Ewing Galloway, N Y

*The Sea of Galilee*

been a vivid reality, and who have seen Him in some or all of many characters.

The influence of Jesus upon all these souls, with their reaction upon their times, must therefore be taken into account in any attempt to estimate the significance of Jesus to the world. That significance, regarded from the purely historical point of view, may be examined in two aspects—*viz* the character of His contribution to religion and to ethics, and the influence exerted by that contribution upon the world. His contribution to religion, in its briefest statement, was the assertion of the Fatherhood of God as a fact, not for one nation only, but for humanity, and of the worth to Him of the individual man, of spiritual values as the only values, and of the continuance after death of the life which has associated itself with God. His ethics were emphatically the ethics of the motive rather than the act, for Him love was 'the fulfilling of the law.' With this idea is associated also the whole character of His method, which had not a little to do with the magnitude of His service to the world. He brought no formulated moral code. Instead of imposing a moral imperative, He inspired an enthusiasm which carried the

will with it. But the passion which Jesus sought to arouse was emphatically not a thirst for personal holiness alone, but a thirst for the highest well-being of the race—an enthusiasm of humanity which sought a good which could only be realized socially.

The influence of that contribution has become, from its very universality, almost impossible to estimate. Modern modes of thought, at least as regards the relation of man to man, have been so far moulded by the ideas of Jesus that the very mind which judges is too full of His contribution to realize its magnitude. Viewed historically, there was little in the record of Jesus' life to prophesy that magnitude. But after His death history shows an unexpected phenomenon. It shows a sect whose founder has just died a malefactor's death, and whose members, in the depths of confusion and despair, are practically hiding for their lives; it shows this sect in the sudden possession of a vigor wholly unexplained, defying every display of force which threatened it, and gathering new converts every day. More than this, the sect is seen spreading through Asia Minor, invading Italy, and establishing in the very city of the Cæsars a throne which has never yet been overturned. Yet this was only the beginning of a development which, in the eyes of any student of it, must remain a tes-



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*One of the Fords of the Jordan*

timony to the sum total of Jesus—His personality, His ideals, and His methods—which places Him first among those who have influenced men and made history.

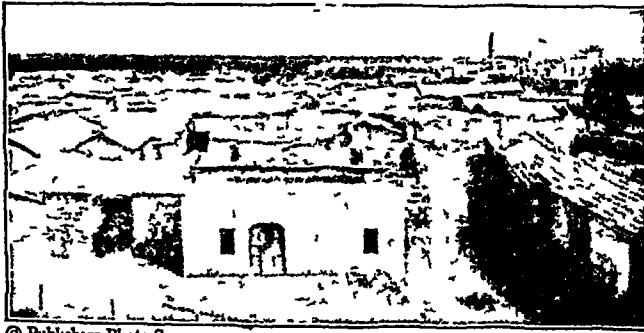
But it is in the region of ethics that His influence has been most penetrating. It was He who first introduced that principle of bearing one another's burdens upon which the whole modern philanthropic attitude, the whole body of feeling in favor of the weak, the poor, and the oppressed, is founded. The process has been one of education, and the ideas which, logically followed out, must develop into the principles of emancipation and religious toleration, were slow in finding their fulfilment. But it is unquestionably the ideas of Jesus which have brought society to the point where the realization of these principles becomes inevitable. But now

(5) For the rise and spread of Christianity, Gibbon's chapters XV and XVI are classic.

**Jesus Sirach** See *Ecclesiasticus*

**Jet** is a kind of lignite or brown coal, which is rendered black by fossilization and by impregnation with bituminous matters. Jet ornaments were valued in early times.

**Jet-propelled Plane**, aircraft developed in 1944. The plane has no propeller, is driven by the force of discharge of expanded gases. Air drawn in through the plane's nose by a small starting engine is first compressed, then crammed into a combustion chamber, where it combines with burning fuel and is greatly expanded. The starting



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*Jericho*

estimate of the influence of Jesus upon the world must remain inadequate, because of the comprehensiveness and strength of that influence. For the most striking feature of Jesus, viewed in its relationship to the world, is His success—success that stands unrivalled, and beside which the other successes of history are small. It has been the belief in all ages of those to whom He has been the dominating influence that this is the success of a personality in whom God was made manifest.

#### *Literature*

(1) *Lives of Christ* W. Sanday, *The Life of Christ*, F. W. Farrar, *Life of Christ*, B. H. Streeter, *The Four Gospels*, Didon, *The Life of Jesus Christ*, Bruce Barton, *The Man Nobody Knows*, T. R. Glover, *The Jesus of History*, Neander, *Life of Jesus*, Gilbert, *The Student's Life of Jesus*.  
(2) *Backgrounds* G. A. Smith, *The Historical Geography of the Holy Land*.

(3) *Teachings of Jesus Christ* Wendt, English translation of *Die Lehre Jesu*—Vol. II.

(4) *Doctrinal Gove*, *Incarnation of the Son of God*.

motor is shut off, a small portion of the expanded gases are used by a turbine to drive compressors, while the remainder discharge through a nozzle at the tail-end of the plane, thus creating the powerful thrust which drives the plane forward. In August 1945 the U. S. War Department revealed details of the jet-propelled Lockheed P-80 *Shooting Star* then in production. Designed by Clarence L. ('Kelly') Johnson, it was the fastest airplane, with 'a speed in excess of 550 m.p.h.' It uses kerosene for fuel, is the simplest American fighting plane to fly, and has a super jet engine. The discovery of the principle of rocket power was made in China, 1232 A.D. Read *The Coming Age of Rocket Power* by G. Edward Pendray.

**Jetsam** See *Flotsam*

**Jetton**, or **Jeton**, a piece of metal or other substance stamped and formerly used as a counter in card games, as well as a ticket of entry to the tables.

**Jeunesse Dorée**, La, was one of several derisive terms applied to the band of young Parisians who strove, after the execution of

Robespierre in 1794, to carry out a reactionary policy, opposed to that of the revolutionists. The name is used in a general sense to denote young dandies living a life of guety and frivolous pleasure.

**Jevons, William Stanley** (1835-82), English political economist and logician, born at Liverpool. A powerful logician, Jevons was yet more widely known as an economist through his *Theory of Political Economy* (1871), etc. See *Letters and Journals* (with bibliography) edited by his wife (1886).

**Jew, The Wandering.** The first mention of the legend of the Jew condemned to wander till the day of judgment for offering insult to Christ on the way to Calvary is ascribed to Matthew of Paris, who professes to have received the fable from an Armenian bishop in 1228. The legend has been poetically treated by Goethe, Schlegel, Stühbert, Shelley, Croly (in *Salathiel, the Immortal*), and 'Monk' Lewis, and by Sue in his famous novel. See Quintet's *Ahasuerus* (1883), Paris's *Le Juif Errant* (1880) and Conway's *Wandering Jew* (1881).

**Jewel, John** (1522-71), bishop of Salisbury (1560), author of *Apologia pro Ecclesia Anglicana* (1562). He was one of the first of those defenders of the English Church, against Rome on the one hand and Puritanism on the other, who are known as Anglicans. See *Life by Le Bas* (1825).

**Jewelry.** In the citadel of Mycenæ certain curious lentoid gems of onyx, agate, serpentine, etc., have been found at a great depth. Bronze seal-rings with intaglio engravings were found in the palace at the same famous site, dating probably as far back as 468 B.C. The jewelry of the middle and of the new empire in Egypt exhibited rare technique and beauty of design. In the Celtic area, during the bronze age and subsequently solid gold ornaments, such as torques, armlets, earrings, and lunettes, represent the perfection of taste, and, as in the case of the unique Hunterston brooch, reveal a delicacy of handiwork and a knowledge of the goldsmith's craft unsurpassed by any modern examples. See Erman's *Life in Ancient Egypt* (1894). See also the articles on GEMS AND PRECIOUS STONES, GOLDSMITHS' AND JEWELLERS' WORK.

**Jewett, Charles Coffin** (1816-68), American bibliographer, was born at Lebanon, Me. As librarian of Brown University (1841-8), librarian of the Smithsonian Institution (1848-58) and superintendent of the Boston

Public Library (1858-68), he devised methods of arranging and cataloguing books that were generally adopted by librarians. He published, among other books, a work *On the Construction of Catalogues of Libraries and their Publication by Means of Separate Stereotyped Titles*.

**Jewett, Milo Parker** (1808-82), American educator, was born at St. Johnsbury, Vt. He is best remembered for having proposed to Matthew Vassar the idea of the college for girls which the latter founded, and of which Dr. Jewett was the first president (1862-4).

**Jewett, Sarah Orne** (1849-1909), American author, born at South Berwick, Me. Her delineations of New England character include *Deephaven* (1877), *A Country Doctor* (1884), *A Native of Winby* (1893), and *The Tory Lover* (1901).

**Jewfish.** The name of several huge sea-bass regarded as game by anglers. Perhaps the best known under this name is the great California species (*Stereolepis gigas*), which frequently exceeds 400 pounds in weight. See Jordan and Evermann *Am. Food and Game Fishes* (1902).

**Jews, History of** (from 70 A.D.) The early history of the race is dealt with under ISRAEL. With the fall of Jerusalem and the triumph of Titus, the enslaved race was hurried into Italy, Spain, and even France, with the greatest center of settlement at Rome, a powerful colony at Cyprus, and another of later influence at Alexandria. Nevertheless Palestine remained till the 5th century the center of Jewish thought. Jochanan ben Zaccai, who escaped from besieged Jerusalem, promulgated the policy for which the rabbis had been long preparing, and which kept the Jews alive during all succeeding centuries. The dispossessed nation should make the law (Torah) its supreme possession, subordinating to it flag, kind, passion, learning, and knowledge. With this motive the Sanhedrin was established at Jabne, subsequently moved to Galilee, and finally set up in Tiberias, until the center of power was shifted to the schools in Pumbeditha in Babylon. The chief of the rabbis, the leadership falling to the house of Hillel, became recognized as the *de facto* chief of Israel, and thus the state within a state was set up. The Mishna grew out of the code of the peoples of Hillel and Shammai, and the Gemara was superimposed on the Mishna, so that the output of theological disquisition—the practical issues of which were codified by Joseph Caro in the

*Shulchan Aruch*—exceeded all other forms of Jewish literature until recent times

The exiled race, chafing under its burdens and embittered by the insults of Hadrian, rose under Bar Cochba (132-3), and guided by Akiba, the scholar and mystic, held the Roman power at bay for one moment. Even then the spirit which sought to re-achieve possession of Palestine was not crushed. The belief in restoration by revolt lasted till the time of Chosroes the Persian, who took Jerusalem in 614. With the fall of the Roman empire the Jewish position was changed. The patriarchate had moved to Babylon, Palestine had become the land of pilgrimage, and the mass of the Jews moved into the Germanic states. About the dawn of the 10th century the Jews were rising to the highest point of prosperity allowed by conditions in Europe. They had settled in small numbers in England, more in France, and held a position with ever-advancing splendor in Spain. In Jewish records the years of the crusades are all black letter, for the onward march of the warriors who were to capture Palestine for Christendom was marked by the wholesale slaughter, torture, and pillage of the Jewish communities, especially in the Rhenish provinces, some of which end their history in the 12th century and only recommence it in the 19th.

From this time the position of the Jews grew steadily worse. In the middle of the 13th century persecution began in real earnest, and finally in 1290 the Jews were expelled from England. In 1392 they were driven from France, in 1492 from Spain, and in 1495 from Portugal. Great numbers took refuge in Italy and Germany; others accepted the welcome of the Turks to Constantinople and the chief cities of Islamic power, and some, from the Iberian peninsula, settled in Holland. In Italy they were to be found in all the great cities in the 14th and 16th centuries, in Turkey they enjoyed special privileges and became an important factor in the commercial life of the Levant. In Germany their lot was less fortunate. They were driven from Bavaria in 1533 and from Brandenburg in 1573. Trading privileges were granted them in Holland in 1603, but they did not acquire rights of citizenship until 1796.

The re-establishment of the Jews throughout Europe began in the 18th century. During the reign of Charles II considerable numbers of Jews returned to Britain, and in 1723 they were distinctly recognized as British subjects. During the reign of Queen Victoria

other Jewish disabilities were removed, so that, in point of law, Jews were placed on practically the same footing as British subjects. They were enfranchised by the Reform act of 1832, and in 1858 were granted the right to sit in Parliament.

Joseph II began the enfranchisement of the Austrian Jews in 1783, and in 1791 the National Assembly, thanks to Mirabeau, emancipated the French Jews—an act which was reaffirmed by the constitution of 1795, 19 years after the Jews had received formal leave to re-enter France. In Denmark in 1814 Jews were placed on a footing of equality as citizens with native Danes. To Sweden they were first invited—the invitation only extending to the rich—in 1746. Norway forbade them to touch its soil till 1860. The Jews in Rome, who were not allowed to leave the ghetto without permits till 1847, benefited from the succession of the house of Savoy, and the founding of the German empire (1871) completed the release of the German Jews. Switzerland emancipated them in 1874, while the Austrian emancipation had been completed in 1868. Meanwhile, Spain and Portugal offered to welcome back the Jews, and in 1878 the Berlin treaty provided for the emancipation of the Jews of Roumania.

In the meantime trouble was brewing in Russia. Admitted into Russia by Peter the Great, the Jews had been expelled by the Empress Elizabeth in 1743, and readmitted by the Empress Catherine II. Alexander II also did much to improve their lot, and offered them new opportunities for assimilation, but under the reactionary policy of Alexander III a new era of oppression began. The Russian attack strengthened the anti-Semitic sentiment in Germany, and the movement spread to the pan-Germanic element in Austria. Thus, in 1894 the Jews had come back to something approaching their mediæval position in Europe. Three notable attempts were made to relieve the Jewish situation. In 1860 Cremieux founded the *Alliance Israélite Universelle*, with a view to uniting the Jews all over the world, to ameliorate the condition of their co-religionists in persecuted lands.

In 1891 Baron Maurice de Hirsch founded the *Jewish Colonization Association* with \$10,000,000 and afterwards bequeathed the greater portion of his wealth for its advancement. With a view to aiding emigration from Russia, colonies were founded in Argentina, in Brazil, in New Jersey, and in Canada. The

third attempt had its origin in the Russian persecutions and its real basis in the old Jewish dream of national restoration. Associations of *Lovers of Zion* were organized, and the movement gradually became international. Under its auspices Rumanian and Russian Jews made their way to Palestine and set up agricultural colonies, the lead having been set by Pesach Tikvah (1878). Baron de Rothschild aided and supported these plans, the Jewish population of Palestine speedily doubled, and settlement was continued amidst considerable hardship. The Sublime Porte, however, was not in sympathy with colossal Jewish immigration into Palestine, and in 1892, out of fear of a Russian advance, the movement was checked. It was revived, however, in 1896 with increased force by the promulgation of 'the Jewish state' by Theodore Herzl of Vienna, and the organization of the modern Zionist movement.

The *Zionist movement* is perhaps the most significant feature of modern Judaism, particularly in view of the occupation of Palestine by the British during World War I and the general recognition of the claims of the Jews to their ancient home. (See *ZIONISM*) The close of the War found hundreds of thousands of Jews destitute and suffering in the devastated countries of Europe. A great relief organization to meet the needs of these sufferers was organized in America and under its auspices large sums of money were raised to finance the work of reconstruction among them.

The Jews of the United States contributed through the United Jewish Campaign over \$125,000,000, from 1915 to the close of 1940. In 1928 the Soviet governments announced that they would contribute \$10,000,000, toward the extension of settling Jewish families in agricultural colonies if Americans would match the sum and Julius Rosenwald immediately pledged a personal contribution of \$5,000,000.

Anti-Semitism had been a basic part of the Nazi program and during Hitler's regime the Jews had been systematically driven out of the Civil Service, universities and schools, law and other professions. Writers and artists had been particularly persecuted and many had been imprisoned or driven out of the country. At the Nuremberg Trials evidence was presented to show that the killing of 5,000,000 Jews had been a planned operation, and that in one year 90,000 had been executed.

In Palestine conflicts between the Jews and Arabs took place in 1933 following the Arab demand for cessation of Jewish immigration into Palestine.

During succeeding years animosity between Jews and Arabs intensified, with frequently recurring outbreaks, which caused loss of thousands of lives in 1938. The British Government, May 17, 1939, declared it not part of their policy that Palestine should become a Jewish state, also that Jewish immigration into Palestine would be closely restricted. In 1947, the subject of Palestine was given to the United Nations.

The total number of Jews in the world in 1939 was approximately 16,000,000 of whom about 9,000,000 were in Europe, 1,000,000 in Asia and more than 5,000,000 in the Americas. In 1946, only slightly more than 1,000,000 Jews were left in Europe.

**Jews, Religion of** The doctrines and teachings of Judaism, the religion of the Jews may be summed up under a number of headings, as follows:

1 *God*—Judaism arose as a protest against ancient forms of nature worship, polytheism, and idolatry. It is based on the existence of the Universe. It had a cause, a creator, who preserves and governs it. That Being is called God.

2 *God and Nature*—God and nature are not identical, as the Pantheists claim. God, according to Judaism, is the Mind, Intelligent Will, or Energy that created, governs, and preserves nature. Nature, and all that it implies, is but a manifestation of God.

3 *Attributes of God*—The qualities usually attributed to God by Judaism are unity, indivisibility, holiness, intelligence, omnipotence.

4 *God the Lawgiver*—God is the lawgiver of the Universe, having decreed that all phenomena in heaven and earth shall be endowed with a certain characteristic law of being and conduct. As the centripetal and centrifugal forces, under inexorable law move and stabilize the planets, so there are spiritual forces acting under moral laws, enacted by the universal Lawgiver, that rule in the conduct of men and nations.

5 *Man*—Judaism is a philosophy of life, a pragmatic philosophy. It takes man as he is, recognizes his dual nature of body and soul, with all their inherent strength and weakness, their tendencies towards good and evil, and aids him to increase the former and overcome the latter in order that he may attain the goal of life—perfection both here

and hereafter Immortality is the reward of the righteous

6 *Rights*—Judaism teaches that man possesses the inalienable rights to life, liberty, property, the pursuit of happiness and perfection. These rights, guaranteed today by the constitutions of civilized nations, were originally taught by the Jewish religion.

7 *Duties*—The duties which should govern the individual are, according to Judaism, those which he owes to God, to himself, to his family, to Israel, to those of other faiths, to his country, to humanity. The relation of the individual to the family is especially emphasized in the Jewish religion. Marriage is regarded as a divine institution into which every man should enter and which he should regard as sacred. The home in Israel is renowned for its purity and sanctity. The parents are the center and authority of the family. Jews are bound together by a common faith, a common history and literature. There exists an unorganized Jewish solidarity which has been cemented by centuries of trials and sufferings, by a martyrdom to convictions in a just cause.

*Ideals of Judaism*—Judaism teaches that individuals, nations, and religions must be impelled by certain ideals that should be so strenuously advocated as to counteract materialism. The principal ideals of Judaism may be expressed as follows: The redemption of the individual (salvation), supremacy of truth, justice, and peace, humanitarianism, Israel, as a priest people, the brotherhood of man, universal peace, the Messianic era.

*A Religion of Law and Love*—Judaism is a religion of law, in the first instance. It emphasizes obedience to law as the very essence of a good life and has always laid great stress upon civil, ethical, and spiritual law, in ancient times also on Levitical law, pertaining to sacrifice, to priests and Levites. It is erroneous, however, to speak of Judaism as a religion of law merely, for it is also a religion of love. Out of the whole Scripture the following commands stand forth to present Judaism par excellence as a Religion of Love: 'Thou shalt love the Lord thy God with all thy heart, with all thy soul and with all thy might,' 'Thou shalt love thy fellow-man as thyself.' These two commands, proclaimed by Moses and to be found in the Old Testament, constitute the essence of Judaism, and by themselves prove that *Judaism is a Religion of Love*.

The important sacred days enjoined by the Jewish religion are the Sabbath, the

Passover, the Feast of Weeks (Pentecost), New Year, the Day of Atonement, the Feast of Tabernacles. The Sabbath is the most important institution of Judaism. It inculcates and preserves the principal teachings of the faith, reverence for and worship of God, the dignity of labor, necessity of adequate rest, the value of consideration to all who work even to the beast of burden.

The Passover festival commemorates the exodus of the Children of Israel from Egypt and the beginning of Israel as an independent people. It is observed for seven days by reform Jews and for eight days by orthodox Jews. The Feast of Weeks (Pentecost) originally an agricultural festival to give thanks for the first ripe fruits, has come to be regarded as commemorative of the revelation of the Law on Sinai. In modern times the Reform Synagogue has added to this festival the beautiful ceremony of the confirmation of children who have reached their 13th or 14th year.

The New Year of the Jewish calendar is intended to mark the beginning of a new spiritual life for the individual and for Israel. The Jew who accepts God as his Judge sets aside this day as the first of ten days of penitence, for the betterment of his soul and for reconciliation to God and man. The Day of Atonement, the last of the ten penitential days, is regarded as the most holy day of the year, the Sabbath of Sabbaths, as it were. It is observed by a fast from sundown to sundown which prepares the soul for serious reflection. The Festival of Tabernacles has become a festival of Thanksgiving in the synagogue and home for the harvest of the field as well as for the product of man's efforts in any field of activity.

*Bibliography*—Consult *The Old Testament*, K. Kohler's *Jewish Theology*, S. Schechter's *Aspects of Rabbinic Theology*, M. Lazarus' *The Ethics of Judaism*, Schwartz, *Faith Through Reason* (1946).

*Jew's Ear*, or *Judas' Ear*, a European fungus (*Hirneola auricula-Judas*) which grows on the elder tree.

*Jew's Harp*, a musical instrument, which consists of a small piece of iron of horse-shoe shape, with a slender tongue of steel, which is made to vibrate. The instrument is held between the parted teeth, and the projecting end of the tongue of steel is twanged with the forefinger.

*Jew's Mallow* (*Corchorus olitorius*), an annual plant belonging to the order Tiliaceæ, native to tropical countries and cultivated to



some extent in the United States. It is grown for the fibre of its inner bark, which constitutes one of the two principal varieties of *jute* (See *JUTE*)

**Jew's Thorn** See *Palinurus*.

**Jeypore** See *Jaipur*

**Jezebel**, daughter of King Ethbaal of Tyre, and wife of Ahab, King of Israel (875-53 B C) notorious for her wickedness

**Jezebel**, a city of Canaan, situated on a western spur of Mount Gilboa. Ahab made it a royal residence, and it was the scene of the murder of Naboth, as also of the tragic end of Ahab's dynasty. The city gave its name to the valley of Jezreel, and also to the plain of Esdraelon. The former is associated with Gideon's triumph over the Midianites and the defeat and death of Saul in battle against the Philistines. Its modern Arabic name is Zerin, and it is the site of only a few uninteresting ruins. Consult G. A. Smith's *Historical Geography of the Holy Land*

**Jhansi**, walled town, United Provinces, India, 60 m. s.e. of Gwalior. During the mutiny of 1857, the Sepoy garrison here massacred the Europeans, but in April of the following year Sir Hugh Rose recovered the fort and town. The fort, on a rocky eminence commanding the city and surrounding country, is now in British hands, p. 70, 208

**Jhelum**, or **Jhelam** (also known as *Bi-tasta*, the *Hydaspes* of the ancients), a river in the Punjab, India, the most westerly of the five streams which give that province its name. Length about 490 miles

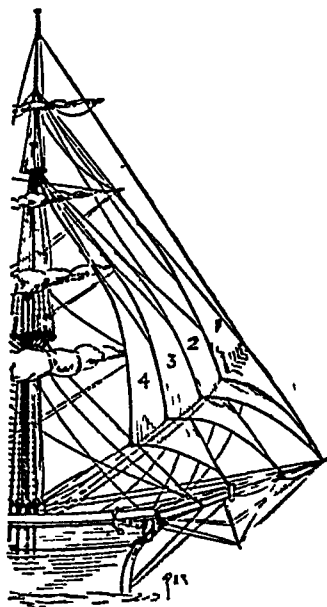
**Jib**, the foremost sail of a ship, being a large triangular staysail extended from the outer end of the bowsprit, which may be prolonged by the jibboom, towards the fore topmasthead. In sloops and schooners the jib is on the bowsprit, and is extended on the lower masthead. A 'flying jib' is a sail set forward of, and in addition to, the jib, and extended on a boom rigged out beyond the jibboom. Beyond this on a stay may be a jib topsail. A 'middle jib' is a sail sometimes set in addition to the jib and flying jib

**Jicarillas**, a division of the Apache Indian tribe. They practice the art of basketry like the Pueblo tribes

**Jig**, a species of dance tune of a merry buoyant character. It is usually written in  $\frac{9}{8}$  or  $\frac{12}{8}$  time. It was originally a form of country dance, but many modifications have greatly altered its early characteristics

**Jig**, in mining, a device for separating minerals of different specific gravity. The pro-

cess of separation depends upon the action of two currents of water, an upward and a downward, through a bed of sand resting on a screen. There are two principal types of jigs—those with movable screens and those with fixed screens, each with various modifications. Jigs with fixed screens are more commonly used



*The Jibs of a Full-rigged Ship*

1, Jib topsail, 2, flying jib, 3, jib, 4, fore topmast staysail

**Jimenez**, town, Mexico, state of Chihuahua, 124 m. s.e. of Chihuahua, p. 6,000

**Jimson Weed**, a common American name, a contraction of 'Jamestown weed,' for the introduced species of *Datura*, which, it is said, were first naturalized at Jamestown, Va. See *DATURA*

**Jingoism**, a term used in politics to express the more extravagant forms of imperialism when it develops into militarism and aggression. In continental politics the same extravagance is called chauvinism. In the United States the idea has been termed 'Spread-Eagleism'

**Jinn**, a class of supernatural beings in Arabic mythology. Old French translators of the *Arabian Nights* wrote it *genie*

**Jinnah**, Mohammed Ali (1876- ), Indian president of All-India Moslem League, which opposed Indian self rule based on Hindu dominance and favored the creation of Pakistan, independent Moslem state

**Jinrickisha**, a small, light, two-wheeled vehicle, used extensively in Japan and other Eastern countries where labor is cheap. It is usually drawn by a single runner, who takes the place of a horse between the shafts.

**Jitney**, a colloquial term for the nickel five-cent piece in American money. The expression first came into general use in 1915 with the establishment in various cities of the so-called 'jitney-bus lines'—offering automobile service over a regular route at a five-cent fare.

**Jiu-Jitsu**. See **Ju-Jitsu**.

**Jivaros**, or **Jeveros**, a South American people of the Upper Marañon. They were reduced by the Spaniards after the conquest of Peru, but revolted in 1599. Consult *Brinton's The American Race*, *Simpson's Travels in the Wilds of Ecuador*.

**Joab**, the most famous of the three sons of Zeruah, the sister of King David of Israel, and the commander-in-chief of David's army, distinguished for his bravery and military skill. He led the assault which resulted in the capture of Zion, and conducted successful campaigns against Syria, Edom, and Ammon. His career is stained, however, by his treacherous murder of Abner and Amasa and the part he played in the matter of Uriah. On the other hand, his slaying of Absalom was politically justifiable, though it cost him the royal favor, his office, and eventually his life, as David on his deathbed gave solemn injunction to Solomon to put him to death.

**Joachim, Joseph** (1831-1907), Hungarian violinist, was born at Kittsee, near Pressburg. He became the foremost violinist of his time as well as a great teacher. He made his first appearance in London in 1844, and thereafter annually visited Great Britain—in his later years also bringing his famous Berlin quartet. His natural predilection for classical music led to his becoming an incomparable exponent of classical works for the violin. His greatest work is his Hungarian concerto (op. 11) for violin and orchestra. Consult *Life* by A. Moser, and *Maitland's Joseph Joachim* (1905).

**Joachim** (d. 1202), founder and abbot of the monastery of Giovanni del Fiore in Calabria, was celebrated as interpreter of the Apocalypse, mystic, and prophet. His principal works, the *Concordia Utriusque Testamenti* and a commentary on the Revelation, arranged the divine governance of the world in three stages corresponding to the Persons of the Trinity—the Old Testament, the New

Testament, and an impending final dispensation of the Holy Spirit.

**Joachimsthal**, town, Northwestern Bohemia, 12 m. n. of Karlsbad. It is celebrated chiefly for its rich deposits of pitchblende, which constitute one of the world's principal sources of radium and uranium, p. about 8,000.

**Joan, Pope**, according to long accredited legend, a woman, born at Mainz or Ingelheim, who, passing herself off as a man, became a professor in Rome, and, on the death of Pope Leo IV in 855, was elected his successor as John VII. That Pope Joan was a fictitious personage was fully proved by Dr. Dollinger. Consult Dollinger's *Fables Respecting the Popes of the Middle Ages*.

**Joan**, 'The Fair Maid of Kent' (1328-85), was the daughter of Edmund of Woodstock, son of Edward I. She appears to have formed a liaison with the Earl of Salisbury, and then to have married Sir Thomas Holland. She became Countess of Kent (1352), and on Holland's death, married the Black Prince (1361), and became the mother of Richard II.

**Joannes Damascenus**, known also as Chrysorrhoeas ('the golden-flowing'), theologian, hymn-writer, and one of the later Greek fathers, was a native of Damascus, and flourished during the first half of the 8th century A.D. His memory is best preserved by his hymns, several of which have been rendered into English, notably 'Tis the day of Resurrection' and 'Come Ye Faithful, Raise the Strain.' The best edition of his works is that of Le Quien (1712, reprinted 1748).

**Joan of Arc** (?1412-31) was born at Domrémy. From the age of thirteen she constantly heard voices, and believing herself called to be the deliverer of France from the English, she sought out the Dauphin at Chinon, who allowed her to join a relief expedition to Orleans. The entry was made Apr. 29, 1429. Within two days under her orders a signal victory was won, and by May 8, the English were in full retreat. Charles entered Rheims on July 15, and was crowned on the 17th. Thus in less than five months, Joan had accomplished her mission of expelling the English from France, and crowning Charles VIII. Enemies multiplied about her, and she was captured by the Burgundians May 24, 1430, and sold to the English. She was imprisoned at Rouen, and brought to a mockery of a trial on Jan. 9, 1431. Pierre Couchon, bishop of Beauvais, engineered her condemnation as a sorceress and heretic, and on May 30, 1431, she was burned at the



*Joan of Arc at the Coronation of Charles VII*  
(From the painting by J E Lenepven in the Pantheon, Paris)



A MEETING BETWEEN GOLDSMITH AUTHOR OF "THE DESERTED  
VILLAGE" AND THE LEARNED DR SAMUEL JOHNSON



stake On Apr 18, 1909, in the basilica of St Peter's at Rome, she was beatified by the Pope in the presence of a multitude including 40,000 pilgrims from France In 1920 Joan of Arc was canonized, her feast being May 30

**Joash**, or **Jehoash**, (1) King of Judah (c 836-796 B C), was the son of King Ahaziah Saved from the truculence of Athaliah, his grandmother, Joash was crowned at her deposition, while only seven years of age (2) King of Israel (c 798-782 B C) the son and successor of Jehoahaz He was one of the ablest rulers and most daring warriors in the royal line of the northern kingdom

**Job**, *Book of*, forms part of the third division of the Hebrew Old Testament, and purports to narrate a lengthened episode in the life of a non Israelite, Job, 'a man in the land of Uz' At Satan's instigation, and with God's permission, he suffers first the loss of his possessions and his family, and thereafter grievous bodily infliction, as a test of his faith and integrity, which, however, is successfully borne He then holds three cycles of long colloquies with his friends Eliphaz, Bildad, and Zophar After the intervention of a fifth debater, the youthful Elihu, and an answer from God with short interruptions from Job, the book closes with a description of Job's ultimate prosperity, all his former possessions being doubled, and a new family born to him

**Jocelin**, or **Joscelin** (fl 1200), a Cistercian monk, who lived at Furness, and then at Down in Ireland He wrote Lives of St Patrick, St Kentigern, and St Waltheof of Melrose

**Jocelin de Brakelonde** (d 1211?), a Benedictine monk at Bury St Edmunds, who wrote a domestic chronicle of his abbey from 1173 to the year 1202

**Jodel**, **Jodelin**, or **Yodel**, a manner of singing which consists of changing suddenly from the chest voice to the falsetto It is much used by the Tyrolese

**Jodelle**, **Etienne** (1532-73), French poet, born at Paris The friend of Ronsard and Du Bellay, he substituted classic plays for the mysteries and morality plays of the Middle Ages

**Jodhpur**, or **Marwar**, the largest feudatory state of Rajputana, India It possesses tin, lead, marble, and iron, salt is manufactured at Sambhar Lake The chief crops are millet and pulse, and leather and brass goods are manufactured Area, 35,000 sq m, p 2,000,000

**Jodhpur**, or **Marwar**, capital of Jodhpur state The fortress, which contains several ancient palaces, stands 300 ft high The ma-

harajah's palace and the Miha Mandir, or 'great temple,' lie to the n e, p 73,000

**Joel**, whose book is the second of the Minor prophets, was the son of Pethuel, Bethuel Nothing is known of his personality, but it is commonly accepted that he belonged to Judah his thoughts centre around Jerusalem

**Joffre**, **Joseph Jacques Césaire** (1852-1931), Marshal of France, engineer, and mathematician, was born at Rivesaltes, Pirenees The Franco-Prussian War (1870) called him as sub-lieutenant to artillery service in a Paris fort Then studying engineering at Fontainebleau, for many years he built forts, roads, and bridges, with fame among experts, and became captain in 1876 He served with distinction in the Franco-German War and in the French



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Marshal Joseph Joffre

colonies in Asia and Africa His thorough mastery of military science assured a rapid rise brigadier-general in command of the artillery in 1901, governor of Lille, division general, in 1905, commander of the Second Army Corps at Amiens, and inspector of military schools, in 1909 In 1910 he was placed on the Superior War Council, and in 1911 made its vice-president and chief of the general staff, the actual head of the army There he pushed the 1913 law for three years' military service

When the First World War began he took command in the field, and drove back the Germans at the momentous Battle of the Marne In 1915 the English army movements were also placed under his control, in December all the French armies in Europe, including the Balkans, were confided to him He wrote *La Préparation de la Guerre et la Conduite des Opérations* (1914-15) (1920)

**Jogues**, **Isaac** (1607-46), was born in Or-

leans, France. A Jesuit and ordained priest, he was sent to North America (1636) as missionary to the Hurons. He was of assistance in concluding peace between the French and Mohawks (1646). Hearing that peace was likely to be broken, he set out for the Mohawk country, and was made prisoner, meeting his death near the present Auriesville, N. Y. He wrote a *Journal* of his captivity and also a *Description of New Netherlands in 1642*. He was one of the Jesuit martyrs of North America, canonized in 1930.

**Johanna, or Anjouan**, one of the Comoro Islands.

**Johannesburg**, the largest city of the Transvaal province, Union of South Africa, and the mining centre of the Transvaal gold

Pacific Exposition, San Francisco (1915). His works include *October, Sear and Gold*, *Piazza San Marco*, *Sunrise in Venice*, *In the Sewing Room*, and numerous portraits.

**John**, the Apostle, one of the disciples, and probably the cousin of Jesus, was the son of Zebedee and Salome, and the younger brother of James 'the Great'. He was a fisherman at Bethsaida, near Capernaum, on the Lake of Galilee, and was there called by Jesus to the discipleship. The Saviour gave the two brothers the name Boanerges, 'Sons of Thunder'. John was the one to whom the Saviour, when on the cross, committed the care of His mother. With Peter and James he formed an inner circle of the disciples.

After the ascension of Jesus, John seems to



*Johannesburg General view of the Mining District*

fields. The Transvaal University College is located here, and there are an art gallery, library, and observatory. Near the suburb of Krugersdorp stands the National Boer Monument, erected to commemorate the declaration of independence of 1880.

In 1886 the site of Johannesburg was bare, open veldt, but in that year the Transvaal government proclaimed certain farms on the famous Reef of Witwatersrand as public gold fields, and the ground was selected as the site of the new town. During the South African War, on May 29, 1900, it was occupied by the British under Lord Roberts, p 519,000.

**Johannisburg**, castle (built 1757-9) in the Rheingau, Germany. Its vineyards produce the famous Johannisberger wines.

**Johansen, John Christen** (1876), American portrait and landscape painter, was born in Copenhagen, Denmark, and was brought to America in infancy. He has received numerous prizes and medals, including the Saltus gold medal of the National Academy of Design (1911) and a gold medal at the Panama-

have remained in Jerusalem, where he still was when Paul visited that city for the second time after his conversion. He does not appear to have been there at the time of the last visit of the Apostle of the Gentiles, about 58 A.D., and his subsequent history is involved in obscurity.

**John, Epistles of**, three writings enumerated among the Catholic epistles, traditionally associated with the Apostle John, and showing evidence that they are the products of a single hand. The first is not an epistle in form but is a practical treatise on the theological principles of the fourth gospel. The second and third are short letters addressed to individuals.

**John, The Gospel According to**, from its position in the New Testament often called the 'fourth gospel,' differs so much in form and character from the other three gospels that it forms a class by itself co-ordinate with what may be called the synoptic tradition. It may be divided as follows: the prologue, the testimony of the first witnesses to Jesus, and of various works and signs, further signs and

conflicts with the Jews, culminating in their resolve to put Jesus to death, the final discourses and the priestly prayer, trial, crucifixion, resurrection, and various manifestations. The work displays a clear and homogeneous plan, having all its parts organically connected with each other and with the whole. John records surprisingly little of the historical matter found in the synoptic gospels—it has nothing about the birth, infancy, temptation, or transfiguration of Jesus, or His agony in the garden, nor does it contain any parables—but, on the other hand, it narrates several incidents, such as the raising of Lazarus, the absence of which from the others strikes us as strange. The tradition which associates the work with the apostle John is ancient and unanimous and attributes the composition of the book to the apostle in his extreme old age.

**John**, the name of no fewer than twenty-three popes, some of whom, in their day, were more or less famous. **JOHN VIII** (872-82) was the Pope who crowned Charles the Bald, emperor of the Romans (875). **JOHN XII** (956-64), whose original name was Octavian, was the first to initiate the practice of changing the pontiff's name. **JOHN XXII** (1316-34) was one of the popes who reigned at Avignon. In the dispute between Frederick of Austria and Louis of Bavaria for the imperial crown he championed the cause of the former. During the contest which ensued, the papal party was expelled from Rome, John was declared deposed, and his legate had to leave the city. But Louis was unable to enforce his claims, and on his return to Germany things reverted to their former position, the anti pope, Nicholas V, set up in opposition to John, went back into retirement.—**John XXIII** (1410-15) so disgraced the name of John that it has never been chosen by any other pope since.

**John** (?1167-1216), king of England, born probably at Oxford, was the youngest son of Henry II, and ascended the throne in 1199. In 1189 he joined Philip of France in a coalition against his father. During Richard I's absence in the Holy Land he attempted to secure the crown, and when Richard was in captivity, he allied himself with Richard's enemy, Philip of France. In 1203 John put to death Arthur, the son of his brother Geoffrey, and the death of John's able mother, Eleanor of Aquitaine, in 1204, was the signal for the conquest of Normandy, Anjou, Maine, and Touraine by the French king. In 1205 a struggle began between the papacy and the English king over the election to the archbishopric of Canterbury. The Pope, Innocent

III, put aside John's candidate, and consecrated Stephen Langton (1208). On the refusal of John to receive Langton, Innocent laid England under an interdict, and in 1212 excommunicated the English king. John then yielded, and agreed to hold his kingdom as a fief of the papacy. But the English barons and clergy now determined to resist John's tyranny, and the defeat of his forces at Bouvines, on July 27, 1214, by Philip, and his own failure to hold Poitou, encouraged the English barons. On June 15, 1215, he was compelled to sign Magna Charta. Consult Adams' *History of England from the Norman Conquest to the Death of John* (1905).

**John**, the name of several kings of Portugal. **JOHN I** (1357-1433), known as 'the Great,' founded the Aviz dynasty. **JOHN II** (1455-95) promoted the discoveries of Portugal in the East.—**JOHN III** (1521-57) established the Inquisition in Portugal, and sent St. Francis Xavier to convert the East.—**JOHN IV** (1603-56) founded the Braganza dynasty, and fought successfully with Spain for the independence of Portugal.—**JOHN VI** (1769-1826) became regent in 1799. In 1807 he transferred his seat of government to Rio Janeiro. On his return in 1822 he accepted the new constitution.

**John II** (1319-64), known as 'the Good'—'the Generous'—became king of France in 1350. Being hard pressed by the king of Navarre and the English, and accused of maladministration of the finances, he surrendered the management of them to the States general. Defeated at Poitiers (1356), he was taken prisoner to England, but returned after the treaty of Breigny (1360). But the Duke of Anjou, whom he left as hostage, having fled, John thought it his duty to go back to England, where he finished his days.

**John II**, or **Hans** (1455-1513), king of Denmark, third son of Christian I, succeeded to the throne of Denmark (1481), and of Norway and Sweden (1483), though only generally recognized in the last mentioned. The collapse of his expedition against the Ditmarshers in the south of Schleswig (1500) led to rebellions both in Norway and in Sweden. The Norwegians were ultimately subdued (1508), but in Sweden, Sten Sture and Svante Sture, successive administrators, wrested the whole kingdom from the Danes, and aided by the Hanseatic League, carried on the war till 1512, when a truce was made.

**John III**, **Sobieski** (1624-96), king of Poland, was born at Olesko in Galicia. By his brilliant victories over the Swedes, Tartars, Turks (at Chotin in 1673), and Cossacks he



gained for himself the throne of Poland (1674). Europe owes to him the relief of Vienna (1683), when it was besieged for the first time by the Turks. He was a man of considerable culture, fond of books and of scientific research.

**John of Austria, Don** (1546-78), Spanish general, natural son of the Emperor Charles V, was born at Ratisbon. Appointed when only twenty-two by Philip II commander of the forces against the rebel Moors of Granada, he triumphantly subdued them. As generalissimo of the combined fleets of Spain and Italy he gained a great naval victory over the Turkish fleet in the Gulf of Lepanto (1571). He commanded an expedition against the Moors in Africa, and took Tunis and Biserta. In 1576 he became governor of the Netherlands.

**John of Bohemia** (1296-1346), the blind king, was son of the Emperor Henry VII, and became king of Bohemia through his marriage with the heiress to the throne. There was a fierce contest between the houses of Austria and Bavaria for the Bohemian empire, and John achieved the victory for Bavaria in 1322 at Muhlendorf. He became an ally of the French king in the war against England, and was slain at Crécy.

**John of Bologna**, called the Fleming (1524-1608), sculptor, was born at Douay, and became sculptor at the court of the Medici. Among his masterpieces are a splendid and impressive fountain of Neptune at Bologna (whence his name), a Mercury in bronze, airy and full of grace, and *The Rape of a Sabine Woman*. His miniature works in bronze won him much fame.

**John of Gaunt** (1340-99), Duke of Lancaster, the fourth son of Edward III, was born in Ghent. After the close of the Black Prince's expedition to help Pedro the Cruel of Castile, John married Constance, daughter of Pedro, and in 1372 assumed the title of King of Castile. In England, where he exercised great influence, he supported Wycliffe, but failed to gain the confidence of the House of Commons. His eldest son, Henry Bolingbroke, became king as Henry IV.

**John of Leyden**, properly **Johann Beuckelszoon** or **Bockhold** (1510-36), a notorious fanatic, was born in Leyden. Having joined the Anabaptists, he established himself in the city of Munster, where he set up a peculiar commonwealth in preparation for the new Zion which he prophesied as about to come.

**John of Salisbury** (c. 1115-80), English scholar. He acted as secretary to Thomas a Becket, accompanied him on his virtual exile in France, and witnessed his assassination

(1170). In 1176 he became Bishop of Chartres. In his *Polycraticus* he sets forth his views on contemporary life, and in his *Metalogicus* deals with contemporary education and thought.

**Johns Hopkins University**, one of the leading American institutions for higher education, situated in Baltimore, Md., incorporated in 1867, and opened in 1876. It was founded by Johns Hopkins, who bequeathed over \$7,000,000 for it and for a hospital, which latter was opened in 1889. The Johns Hopkins Medical School was established in 1893. In 1916 a school of hygiene and public health was inaugurated through the co-operation of the Rockefeller Foundation of New York. From the inception of the University the chief stress has been laid on graduate work and original research. The university publishes several important journals, among which are the *American Journal of Philology*, *Studies in Historical and Political Science*, and *Modern Language Notes*.

In 1901-2 a gift of 176 acres of land in the suburbs of Baltimore and an endowment of \$1,000,000 was made to the University by its friends. In 1914 the State of Maryland appropriated \$1,400,000 to establish the William H. Welch Endowment for Clinical Education and Research. In 1919 Joseph de Lamar bequeathed \$2,500,000 for instruction and research in medicine. In February, 1930, the Walter Hines Page School of International Relations was inaugurated. The first president of the University was Dr. Daniel Coit Gilman. Isaiah Bowman was elected president in 1935.

**Johnson, Andrew** (1808-75), 17th President of the United States, was born in Raleigh, N. C., on Dec. 29, 1808. Though a States' Rights Democrat in politics, Johnson joined Brownlow and others in ardent support of the Union on the approach of the Civil War. From 1862 to 1864 he was the military governor of Tennessee, a position of extreme difficulty, the duties of which he discharged with such efficiency and courage that he attracted the attention of the whole North. In 1864, though still essentially a Democrat, he was nominated for the vice-presidency, on the ticket with Lincoln, by the Republicans, who wished thus to recognize the Unionist element in the South.

Johnson's succession to the presidency (1865), upon the assassination of President Lincoln, was regarded with considerable misgiving. Within two weeks of his inauguration the Civil War was virtually brought to a close by the surrender of the Confederate General

Johnson (April 26, 1865) Upon the President, in conjunction with Congress, developed the reconstruction of the Southern States Johnson's policy was substantially what Lincoln's had been, but he was without Lincoln's shrewdness and consummate tact Moreover, he was a Southern Democrat among Northern Republicans, and inevitably came into conflict with Congress, which contended that reconstruction belonged properly to the legislative branch of government Bill after bill passed by Congress was vetoed by the President, often in messages of great power and of remarkable cogency of reasoning, but his veto was usually overridden Eventually he was impeached, chiefly for having disregarded the Tenure of Office Act, passed primarily to compel his retention of Secretary of War Stanton in the Cabinet After a sensational trial before the Senate, he was acquitted (May 26, 1868), the vote of 36 to 19 for conviction failing by one of the requisite two-thirds Although opinionated, stubborn, and lacking in personal magnetism, Johnson was a man of the strictest integrity, and of considerable ability, and sincerely and earnestly wished to serve the best interests of his country

**Johnson, Bradley Tyler** (1829-1903), American soldier and lawyer, was born in Frederick, Md Among his publications were a military biography of General Washington, and a *Life of Gen Joseph E Johnston*

**Johnson, Bushrod Rust** (1817-80), American soldier, was born in Belmont co, Ohio When the Civil War broke out he entered the Confederate Army, became a brigadier-general (1862), and advanced to the rank of major-general (1864) He was badly wounded at the battle of Shiloh (April 1862) As a major-general under Lee he had command of a division At the close of the war he was appointed superintendent of the military department and chancellor of the University of Nashville

**Johnson, Cave** (1793-1866), American legislator, was born in Robertson co, Tenn He was Postmaster-General of the United States in the Cabinet of President Polk (1845-9), and was president of the State Bank of Tennessee (1850-9)

**Johnson, Eastman** (1824-1906), American painter, was born in Lovell, Me He achieved his first notable success with the *Old Kentucky Home* (1858) He became an academician in 1860 His *genre* paintings of New England country life appealed to professionals and laymen alike, and his portraits of distinguished men in many cases became the standard likenesses of their subjects Among his other

paintings are *The Husking Bee* (1876), *Cranberry Harvest*, *Nantucket* (1880), *The Funding Bill* (1881), *Milton Dictating to his Daughters* is his best-known work

**Johnson, Emory Richard** (1864- ) American economist and educator, was born in Waupun, Wis He was a member of the U S Isthmian Canal Commission (1899-1904) and special commissioner on Panama Canal tolls and measurement rules (1911-13), editor of the *Annals of the American Academy of Political and Social Science* (1901-14), and was employed as an expert in many transportation problems He was President of the National Institute of Social Sciences in 1918-1922, and was awarded the gold medal of the Institute in 1923 His published works include *Inland Waterways* (1893), *American Railway Transportation* (1903), *History of Domestic and Foreign Commerce of the United States* (2 vols, 1915), *Principles of Ocean Transportation* (1917), *Railroads and Public Welfare* (1944)

**Johnson, Herschel Vespasian** (1812-80), American lawyer and legislator, was born in Burke co, Ga He became one of the most prominent lawyers of the State



*Hugh Johnson*

**Johnson, Hiram Warren** (1866-1945), American lawyer and public official was born in Sacramento, Calif He came into public notice by the successful issue to which he brought the sensational graft prosecutions in San Francisco in 1908 In 1910 he was elected governor of California by a majority of more than 22,000 votes He was reelected for the term 1915-1919, but resigned March 15, 1917, when he was elected United States Senator from California (four terms, 1917-41) His gubernatorial administration was active and progressive, marked by many important reforms in State affairs He passed through the State legislature more than twenty amend-

ments to the State constitution. One of the Founders of the Progressive Party, he became the new party's candidate for the Vice-Presidency in 1912. He later returned to the Republican fold, and in 1920 was one of the leading candidates for the Republican nomination for the Presidency. Johnson was a leader in the Senate's historic struggle to keep the U S out of the League of Nations. He bolted Herbert Hoover to support Franklin D. Roosevelt for the Presidency. He was re-elected to the Senate in 1934.

**Johnson, Hugh S.** (1882-1942), American soldier, lawyer and public official, was born at Fort Scott, Kans., and educated at West Point and University of California. He was a U S cavalry officer, went with Pershing's expedition into Mexico, 1916, originated the plan of the selective draft in the World War, was promoted to rank of brigadier-general, and resigned from the army, 1919. For a time he was engaged in industrial and agricultural economic research. He helped draft the National Industrial Recovery Act, 1933, and was its first administrator, 1933-34. He was later known best as a newspaper columnist and as a radio commentator.

**Johnson, Sir John** (1742-1830), American Tory leader, son of Sir William Johnson. In 1779 he was beaten at Newton (now Elmira) by General Sullivan.

**Johnson, John Albert** (1861-1909), American political leader, born at St. Peter, Minn. In 1904 he was elected Democratic governor, and was reelected in 1906 and 1908. Many reform measures marked his administration.

**Johnson, Josephine Winslow** (1910- ), author, was born in Missouri. Her first novel *Now in November* was published in 1935. It won for her the Pulitzer award. She was a frequent contributor of short stories to leading American magazines. Some of her stories are *The Poet to His Friend* and *Prelude to Winter*.

**Johnson, Martin** (1884-1937), an American explorer, was born in Rockford, Illinois. Since 1910, with his wife, Osa Johnson, he had made six expeditions around the world. While on a lecture tour with his wife in 1937, he was injured in an airplane crash in California and died shortly thereafter. Books: *Through the South Seas with Jack London* (1912), *Safari* (1927), *Lion* (1929), *Over African Jungles* (1935), *Congorilla* (1936).

**Johnson, Owen McMahon** (1878- ), American novelist, was born in New York City. He published *Arrows of the Almighty*

(1901), *The Varmint* (1910), *Stover at Yale* (1911), *The Salamander* (1913), *Virtuous Wives* (1917), *Children of Divorce* (1927), *Coming of the Amazons* (1931).

**Johnson, Reverdy** (1796-1876), American legislator, was born in Annapolis, Md. He was U S Senator from 1863 to 1868, resigning to become U S Minister to Great Britain. He negotiated the Johnson-Clarendon treaty to settle the Alabama claims.

**Johnson, Richard Mentor** (1781-1850), ninth Vice-President of the United States, was born in Kentucky. He distinguished himself in the Battle of the Thames (Oct. 5, 1813), in which he is said to have personally slain the Indian chief Tecumseh. From 1819 to 1829 he was a member of the U S Senate, from 1829 to 1837 a Representative in Congress, and from 1837 to 1841 Vice-President of the United States.

**Johnson, Robert Underwood** (1853-1937), American author. He joined the *Century* (then *Scribner's*) staff in 1873, associate editor in 1881, and editor-in-chief from 1909. For his services as secretary of the American Copyright League, in establishing international copyright in the United States he was decorated by the French and Italian governments. He later became secretary of the American Academy of Arts and Letters, and Director of the Hall of Fame. He published books of poems, including *The Pact of Honor and other Poems* (1929) and *Poems of the Lighter Touch* (1930).

**Johnson, Rossiter** (1840-1931), American author, was born in Rochester, N Y. He became editor of the *Annual Cyclopaedia* (1863-1902), and associate editor of the *Standard Dictionary* (1892-4).

**Johnson, Samuel** (1709-84), English lexicographer, was born in Lichfield, Staffordshire. In 1737 he went to London in company with David Garrick, and in the following year obtained regular employment on the *Gentleman's Magazine*. In May, 1738, Dr. Johnson published his 1st poem, *London*, in imitation of the third satire of Juvenal. Its success won him the friendly interest of Pope. Two years later appeared his *Life of Savage*, afterward included in the *Lives of the Poets*, it brought him at once into note. His reputation grew so steadily that in 1747 several London booksellers contracted with him for a *Dictionary of the English Language*. This work is of great historical importance as a record of the language in the 18th century.

In 1749 Johnson published the *Vanity of Human Wishes*, an imitation of the tenth

satire of Juvenal, and his best poem. In March, 1750, Johnson started the *Rambler*, a periodical on the model of the *Spectator*, and it appeared regularly every Tuesday and Saturday till March, 1752. In 1759 he wrote *Rasselas, Prince of Abyssinia*, in the evenings of a week.

In 1762 he was granted a pension of £300 by Lord Bute, and from this time dates his literary dictatorship, which was confirmed by the founding of the Literary Club in 1764. In 1773 Johnson was induced by Boswell, whom he had known since 1763, to set out on the memorable tour of the Hebrides. Both travellers have left records of their experiences—Johnson's *Journey to the Western Islands of Scotland*, appearing in 1775.



Samuel Johnson

But Johnson was yet to write his greatest work, the *Lives of the Poets*. The first four volumes appeared in 1779, and the remaining six in 1781. Altogether there are fifty-two *Lives*, and of these only one—that of Young—is by another hand. With all its faults, the *Lives of the Poets* remains one of the greatest monuments of English criticism. The accounts of Dryden and Pope are masterpieces. Consult Boswell's *Life*, edited by Augustine Birrell (1906), Piozzi's *Anecdotes of Johnson*, Leslie Stephen's *Johnson*, Hill's *Dr Johnson*, Grant's *Johnson* (1905), Matthew Arnold's *Essays in Criticism* (3d series, 1910), Bailey's *Dr Johnson and His Circle* (1944).

Johnson, Thomas (1732-1819), American jurist, born in Calvert co., Md. He was a member of the Continental Congress (1774-7), and nominated Washington to be commander-in-chief of the Continental Army. He was the first State governor of Maryland (1777-9), and an Associate Justice of the U. S. Supreme Court (1791-3).

Johnson, Tom Loftin (1854-1911), American political leader, was born in Georgetown, Ky. He was a member of Congress from 1891 to 1895, and mayor of Cleveland, O., from 1901 to 1909. He was well known as an advocate of the single-tax theory, and as an adherent of Henry George.

Johnson, Sir William (1715-74), British soldier, was born in Smithtown, County Meath, Ireland. In 1753 and again in 1754 his influence with the Indians averted a rupture between them and the colonists, and in 1755 General Braddock put him in charge of all the affairs of the Six Nations. With the rank of major-general, he led the colonial troops against Crown Point in 1755, and defeated Dieskau at Lake George. From 1756 until his death he was 'colonel, agent and sole superintendent of the affairs of the Six Nations and other Northern Indians' under the King's commission. For these and many other services he received from King George 100,000 acres of land north of the Mohawk, a tract afterward known as 'Kingsland' or the 'Royal Grant'. He planned and practically built at his own expense the village of Johnstown. In 1768 he negotiated the important treaty of Fort Stanwix with the Indians.

Johnson, William Samuel (1727-1819), American jurist and educator, the son of Samuel Johnson (1696-1772), was born in Stratford, Conn. He took no active part in the Revolutionary War, but was afterwards a member of the Continental Congress (1784-7), and was one of Connecticut's first U. S. senators (1789-91). From 1787 until 1800 he was president of Columbia College under its new charter changing its name from Kings College.

Johnson City, town, Tennessee. The great Smoky Mountains are a few miles distant, and the place is popular as a summer resort, p. 25332.

Johnson Grass (*Sorghum halepense*), a grass introduced from Turkey into South Carolina about 1830, and now common throughout the warmer parts of the United States and of South America.

Johnston, Albert Sidney (1803-62), American soldier, prominent as a Confederate general in the Civil War, was born in Washington, Ky. In the Texan and Mexican Wars, he took a prominent part. He commanded the Confederate army in the battle of Shiloh (April 6-7, 1862), until mortally wounded early in the afternoon of the first day. He has been ranked by competent military critics as in natural endowments the ablest of the Confederate generals, with the probable exception of Lee.

**Johnston, Eric A** (1896- ), business executive, was born in Washington, D C, student at Univ of Washington 1913-17, served as capt of U S Marine Corps 1917-22. He founded Columbia Electric and Mfg Co. Was director of the U S Chamber of Commerce 1934-41, president of Chamber of Commerce 1942- , president of Motion Picture Producers and Distributors Inc 1945.

**Johnston, Sir Henry (Harry) Hamilton** (1858-1927), English administrator and explorer, was born in Kensington, London. In 1889 he made an expedition to Lakes Nyasa and Tanganyika, which led to the founding of the British Central Africa Protectorate. He was administrator of the protectorate (1891-7), consul-general at Tunis (1897-99), and in 1899-1901 was special commissioner and commander-in-chief for the Ygando Protectorate.

**Johnston, Joseph Eggleston** (1807-91), American soldier, a prominent Confederate general in the Civil War, was born in Prince Edward co, Va. In 1860 he became quartermaster-general of the U S army with the rank of brigadier-general. He resigned from the army in April 1861, became a major-general in the Virginia army, and shortly thereafter was commissioned a brigadier-general by President Davis, being the only U S officer of such high rank to enter the Confederate service. He was the ranking officer in the first battle of Bull Run (July 21, 1861), arriving so opportunely as to change the fortune of the day. He opposed General McClellan in the Peninsular campaign. Johnston commanded the Confederate army opposed to General Sherman in the Atlanta campaign, but his cautious policy met with much popular criticism, and he was superseded by the more venturesome Hood in July, 1864. Early in 1865 he was placed in command of the Confederate forces in the Carolinas, and once more was opposed to Sherman, to whom he finally surrendered on April 26, 1865 (a little more than two weeks after the surrender of Lee).

**Johnston, Mary** (1870-1936), American author, was born in Buchanan, Virginia. Her first novel, *Prisoners of Hope*, appeared in 1898, followed by *To Have and to Hold*, which was published as a serial in the *Atlantic Monthly*. Among her other novels are *The Witches* (1914), *Michael Forth* (1919), *Silver Cross* (1921).

**Johnston, Richard Malcolm** (1822-98), American author, was born in Powelton, Ga, and was graduated in 1841 from Mercer University. He practised law for several years,

and was professor of literature at the University of Georgia, 1857-61, and served on the Confederate side in the Civil War.

**Johnstown**, city, New York. It is a place of historic interest, settled in 1760 and named after Sir William Johnson, to whom there is a monument, and whose home, the only baronial mansion now in the United States, is still standing. Here the Indians often met to confer with Johnson. An engagement was fought here in 1781, between the British and the Americans, resulting in a victory for the latter, p 10,666.

**Johnstown**, city, Pennsylvania. It is built on high ground, in the midst of beautiful mountain scenery. It has large iron and steel industries, including those of the Cambria and Lorain Steel Companies. There are also extensive coal interests. The town was submerged by the bursting of the South Fork Reservoir on May 31, 1889, and more than 2,000 lives were lost, p 66,668.

**John the Baptist**, the forerunner of Jesus Christ, was the son of Zacharias, a priest, and Elisabeth, a near relative of Mary, the mother of Jesus. His 'shewing unto Israel' was the beginning of a short ministry of amazing energy and power, the whole land being shaken by his demand of repentance, his proclamation of the Kingdom of God, and his rite of baptism. He baptized Jesus, but asserted, both on that occasion and later, his own inferiority.

**Joinery** is the art of making and fitting the interior woodwork of a building, as opposed to carpentry, which concerns itself with the framework essential for the stability of the structure. Joiner's work, which in its finer branches is often spoken of as cabinet making, includes doors, windows, wooden stairs and their accessory parts. The various pieces are cut and shaped chiefly by machinery. The actual work of the joiner is, thus often confined to fixing together the component parts, which must be done with great care and exactness. Among the subsidiary operations of joiner's work, the most important is the making of joints. These are of three main classes — (1) For joining together boards which lie in the same plane, so as to cover a floor or other large surface. (2) For connecting the ends of boards which meet at a right angle the ordinary dovetail joint is the most efficient. The edges of each board are cut into a series of alternate projections and indentations, which fit into each other, and which by the bevel of their sides prevent the boards from drawing apart. In a 'lap dovetail' the projections on one board

do not extend through the whole thickness of the other, and thus leave one face in which the joint does not show. In 'mitre joints' the edges of the boards are cut to a bevel, so that the plane of the joint bisects the angle at which they meet. Unless strengthened by keys of hard wood or by a 'slip-feather' this joint depends entirely on the glue which binds it. (3) For forming framework, mortise and-tenon joints are generally used, as in carpentry. In these the projecting piece, or tenon, on the end of one piece of wood fits tightly into the hole or mortise, cut into the side of the other, and is glued in place.

**Joint Adventure** A partnership confined to a particular speculation or transaction. Examples are agreements to promote the sale of mineral or patent rights, or to combine forces for the creation of a 'corner' in grain or a 'pool' in a stock transaction.

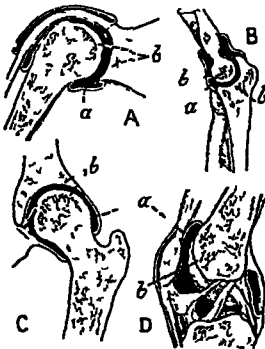
**Joints**, in morphology. Anatomically, a joint is formed by the approximation of two or more bones which are bound together and enveloped by other structures. A distinction must be drawn between rigid and mobile ar-

acquires a considerable degree of flexibility from a series of such articulations. Joints which are freely movable are called *diarthroses*. The part of each bone which enters into the formation of a diarthrosis is covered by a thin layer of cartilage, which acts as a smooth bearing surface over which the other moves with little friction. A joint of this nature is also provided with fibrous ligaments, which by binding the bones together limit the range of movement, and with a synovial capsule of sac, the inner surface of which secretes a glairy lubricating fluid known as the *synovia*. The outer layers of the synovial capsule are dense and fibrous, and the whole forms a bag enclosing the joint cavity into which the articular surfaces protrude. In the knee and maxillary joints are interarticular pads of cartilage, which, besides giving greater elasticity, allow of more complicated movements. Diarthroses may be hinge-shaped, or of the ball and-socket form, or, again, the movement may be either gliding or rotatory. The ball-and-socket joint gives the widest range of movement, as in the shoulder, in which the ball shaped head of the humerus is applied to the shallow glenoid fossa or socket of the scapula.

Of injuries, a dislocation is a separation of the articular surfaces. Like fractures, dislocations may be either simple or compound, the latter term being employed when, from laceration of the surrounding tissues, a communication is established between the joint cavity and the external air.

One of the commonest affections of an articulation is inflammation of the synovial membrane, or synovitis, which may be acute or chronic. In a large number of cases it is associated with some general pathological condition, such as rheumatism. Another group of joint diseases includes those of tubercular origin and those into which, arising from a traumatism, tuberculosis gains entrance secondarily. The joints most frequently affected by tuberculosis are those between the vertebrae and those of the lower limb. Tumors involving joints generally have their origin in the ends of the long bones. They are nearly always of a sarcomatous type, but may be wholly cartilaginous.

**Joints**, in geology, are fissures which traverse the rocks of the earth's crust, mostly in a vertical or nearly vertical direction. They are usually open, though their width may be very small. They serve as passages for the circulation of underground water, and those which are nearest the surface may be widened by solution or filled with debris. Joints are de-



*Joints of the Arm and the Leg*

A, Shoulder joint, B, elbow joint, C, hip joint, D, knee joint (in section) a, Synovial capsules, b, interarticular cartilage

ticulations. Good examples of the former are the sutures or *synarthroses* of the cranial bones, whose serrated edges interlock with only a thin sutural membrane between. When adjacent bones are separated by a plate of cartilage which is adherent to each, a limited amount of mobility results, and such a joint is known as a mixed articulation, or an *amphiarthrosis*. The joints between the vertebrae are of this type, and while the movement possible at each joint is but slight, the spine as a whole

veloped in perfection only in rocks which are hard and coherent, in sands, clays, and gravels they are absent or rare. In bedded sediments the joints are perpendicular to the bedding planes, and very frequently run in two directions, one set being nearly at right angles to the other. The master joints have usually a close relation to the dip of the strata, and as this is a consequence of the folding which has resulted from lateral earth pressure, it seems reasonable to believe that folding is an important factor in the production of joints. This is supported by the experiments of Daubree. Where movement has taken place along a joint, it becomes a fault. Joints in some cases have been injected with igneous material, forming dikes. In the igneous rocks the jointing is very frequently columnar. Very perfect examples are furnished by the basaltic rocks of the Giant's Causeway and the west of Scotland. There can be no doubt that these joints are due to contraction on cooling. Columnar jointing is sometimes produced in sandstones which have been greatly heated by contact with an intrusive igneous mass. Joints of this type are always perpendicular to the surfaces of cooling.

**Joint Tenancy** The ownership of land or goods by two or more persons in such a way that each one is deemed to own the whole as well as an undivided share. This is the only interpretation that can be put on the mysterious phrase of Norman-French law by which joint-tenancy is characterized—that the ownership is *per my et per tout*.

**Joinville, Jean, Sire de (1224-1317)**, French historian, who accompanied (St.) Louis IX of France in his crusade of 1248-54. His *Histoire de St. Louis* was begun when Joinville was almost eighty.

**Jókai, Mór or Maurus (1825-1904)**, novelist of Hungary. His first book, *Helköznepök* (1845), made the reputation of its author, who, as the editor of the literary journal *Elet Kepek* ('Pictures from Life') gathered around him the rising talent of the country. The most notable English translations of his novels are *Timar's Two Worlds* (1888), *Black Diamonds* (1896), *The Baron's Sons* (1902), *Tales from Jokai* (1904).

**Jokjokarta, or Djokjokarta**, town, Java. The most notable feature is the citadel of the native prince, a vast walled enclosure, p 79,567

**Joliet**, city, Illinois, county seat of Will co., on the Des Plaines River and the Illinois and Michigan Canal. The State Prison, with a magnificent building constructed of Silurian

limestone from adjacent quarries, is located here, and there are extensive manufactures of flour, steel tools and other products, p 42,365

**Joliet, Louis (1645-c 1700)**, famous French-Canadian explorer, was born in Quebec. He became one of the most adventurous of the early Canadian fur traders and explorers. In 1673, with the Jesuit Jacques Marquette, he was sent by Talon, the intendant of Canada, to explore the Mississippi River. Proceeding by way of Green Bay and the Wisconsin River, on June 17, 1673, the explorers reached the Mississippi, and mapped its course to the Gulf of Mexico.

**Joliot, Frederick (1900- )**, Fr. physicist, shared the Nobel Prize in chemistry with his wife, Irene Curie Joliot, in 1935 for the discovery of artificial radio-activity.

**Joliot, Irene Curie (1897- )**, was daughter of Marie Curie, who won the Nobel Prize in 1911 for work with radium. In 1935 Mme Joliot, who with her husband, Frederick Joliot, had continued the work her mother had begun, won the Nobel Prize for the discovery of artificial radio-activity.

**Jolson, Al (1886- )**, actor, singer. In 1911 he appeared in *La Belle Paree* at the Winter Garden in New York and has since starred in numerous plays and motion pictures including *The Singing Fool* and *Say it with Songs*.

**Jonah**, the son of Amittai, a native of Gathhepher in Zebulun, a Hebrew prophet who lived in the time of Jeroboam.

**Jonah, The Book of** (so-called), in the Old Testament, the fifth book of the Minor Prophets. Its authorship is uncertain. It does not, in all probability, belong to the period of the prophet of that name, being apparently of a much later date. It recounts how the prophet was commanded by God to preach in Nineveh, how he fled instead to Tarshish, how on the voyage he was cast overboard, swallowed by a great fish, and liberated again after three days, how eventually he preached to the Ninevites, was instrumental in bringing them to repentance, and was displeased at the result.

**Jonas, Justus (1493-1555)**, German reformer, was born in Nordhausen. He was an intimate friend of Luther, whom he accompanied to the Diet of Worms, and assisted in his translation of the Bible.

**Jonathan**, eldest son of King Saul. His prowess and ingenuity were shown in his successful attack on the Philistines at Michmash, but it is the warmth and disinterestedness of

his friendship with David which keep his memory fresh

**Jones, Alexander** (c 1802-63), American inventor, was born in North Carolina. He practised medicine in Mississippi, and while there invented various improvements in the cotton gin. He devised a system of ciphers for the Associated Press, and invented a street-sweeping machine.

**Jones, Anson** (1798-1858), the last president of the Republic of Texas, was born in Great Barrington, Mass. He removed to Texas in 1833, took an active part in the War for Texas Independence, was the minister of Texas to the United States (1838) and was successively president of the Texan Senate, secretary of the state of Texas, and president of the republic (1844-6), vigorously opposing annexation to the United States.

**Jones, Ernest Charles** (1819-69), English Chartist leader, was born in Berlin. Called to the bar (1844), he identified himself with the Chartist movement (1846), and soon became one of its foremost orators. His poems are of considerable merit, especially *The Battle Day* (1855), *Song of the Poorer Classes*, and other lyrics.

**Jones, Harry Clary** (1865-1917), American chemist, was born in New London, Md. His publications include *Hydrates in Aqueous Solutions* (1907), *The Absorption Spectra of Solutions* (1909), *A New Era in Chemistry* (1913).

**Jones, Henry** (1831-99), author of 'Cavendish's *Laws and Principles of Whist*', was born in London.

**Jones, Henry Arthur** (1851-1929), English dramatist, was born in Grandborough, Buckinghamshire. His first definite success was made in melodrama with *The Silver King* in 1882—the most important successors to which were *Saints and Sinners* (1884), *The Middleman* (1889) and *Judah* (1890). Other plays are *Mary Goes First* and *The Lie*.

**Jones, Inigo** (c 1573-1652), English architect, born in London. He is said to have designed the palaces of Rosenborg and Frederiksborg in Denmark. On his return to England (1604), he designed the scenery for Ben Jonson's *Masque of Blackness*, given at Whitehall. His chief work was the design for the banqueting hall at Whitehall (1619-22), now the Chapel Royal.

**Jones, Jesse Holman** (1874- ), builder, financier, was born in Robertson co., Tennessee. He entered lumber business in Texas, acquired extensive banking and real estate interests, and became owner and publisher of *Houston Chronicle*, was prominent in

Red Cross work during World War I. He became chairman of Reconstruction Finance Corporation, 1933, also member of National Emergency Council, 1933. He was awarded regency in field of finance, 1935, by Society of Arts and Sciences. He was U S Secretary of Commerce, 1940-45.

**Jones, John Paul** (1747-92), famous Scotch-American naval officer, in the service successively of the United States and Russia. He was born near the hamlet of Arbigland in the parish of Kirkbean, Kirkcudbright, Scotland, and was the son of a peasant named John Paul. He became a planter near the Rappahannock in Virginia, espoused the cause of the colonies on the outbreak of the American Revolution (1775), was consulted by the Continental Congress concerning the organization of a navy, and in December, 1775, was commissioned as a lieutenant in the newly-organized naval service. He assumed temporary command of the *Alfred*, and on it displayed the first flag—the 'Pine tree and Rattlesnake Flag'—ever displayed on an American man-of-war. He then, as captain (1776), commanded in turn the *Providence*, the *Alfred* (1776), and the *Ranger* (1777-8), cruised around the British Isles, did great damage to British shipping, even dashing into British ports for the purpose, and defeated and captured off Carrickfergus the British sloop of-war *Drake* (April 23, 1778), 'the first instance in modern naval warfare,' says the best of Jones's biographers (Buell), 'of the capture of a regular British man-of-war by a ship of inferior force.' As commodore of a small French squadron displaying the stars and stripes, he again made a circuit of the British Isles, and in a famous naval battle between the *Bonhomme Richard* and the British warship *Serapis* (44 guns) on Sept. 23, 1779, defeated and captured his antagonist. From 1788 until 1791 he was a vice-admiral in the Russian service, commanded a squadron in the Black Sea, and defeated the Turkish navy in the battle of the Liman (June 17, 1788). A memorial was unveiled to him in Washington, D. C., in 1912.

**Jones, Owen** (1809-74), English architect and decorator, born in London, took a leading part in the decoration of the buildings for the exhibition of 1851. Among his publications are *Designs for Mosaic and Tessellated Pavements* (1842), and *The Grammar of Ornament* (1856), his principal work.

**Jones, Samuel Milton** (1846-1904), American manufacturer, known as 'Golden Rule' Jones for his advocacy of honest dealing in political and business life, was born near



Beddgelert, Wales He made successful inventions and established a factory for their manufacture at Toledo, Ohio, of which city he was elected mayor in 1897, as a Republican, and re-elected in 1899, 1901, and 1903 on independent tickets

**Jones, Thomas ap Catesby** (1787-1858), American naval officer, was born in Virginia He served in the Gulf Squadron against pirates, smugglers, and slave-traders in 1808-12

**Jones, Wesley L** (1863-1932), American legislator, born near Bethany, Ill In 1929 he was the author of the Jones Act increasing penalties for violation of the Prohibition Law

**Jones, Sir William** (1746-94), English Oriental scholar, born in London He made a careful study of Hindu law, the results of which were published in 1800 by Colebrooke as *Digest of Hindu Laws* His translation of the *Institutes of Manu* appeared in 1794 Among his other publications are *A Persian Grammar* (1772), and translation of the ancient Arabic poems called *Moallakat* (1783) But it was as the English pioneer in the study of Sanskrit that his influence was greatest In 1784 he founded the Bengal Asiatic Society

**Jongleurs Jugglers, or Jocolatores**, a caste of wandering minstrels and mountebanks in mediæval Europe

**Jonkoping**, capital of the county of the same name Sweden Here (1809) peace was concluded between Sweden and Denmark, p 30,119

**Jonquil** (*Narcissus jonquilla*) is a native of Spain, but widely cultivated It is hardy and bears very sweet-scented yellow flowers in early spring

**Jonson, Ben** (?1573-1637), English poet and dramatist claimed descent from the Johnstons of Annandale He was born probably in Westminster In 1598 his *Every Man in his Humor* was acted at the Globe, possibly through the good offices of Shakespeare, and was followed in 1599 by *Every Man out of his Humor* The children of the Queen's Chapel produced his *Cynthia's Revels* (1600) and *Poetaster* (1601) The latter play was an episode in the 'war of the theatres,' not to be taken too seriously, in which Jonson on one side, and Shakespeare, Marston, and Dekker on the other, led the hosts *Sejanus* appeared at the Globe in 1603 With the accession of James I began the long series of Jonson's court masques, for which he provided the poetry and the learning, and Inigo Jones the architecture In 1605 he joined Chapman and Marston in prison on account of the criticism of the Scots in their joint play of *Eastward Ho* He was the center,

with John Donne, of a brilliant circle of wits He was on friendly terms with Shakespeare and with Bacon *Volpone, Epicæne, The Alchemist, Catiline, Bartholomew Fayre, The Case is Altered*, and *The Devil is an Ass* were all produced between 1605 and 1615 At his death, one of his best pieces, *The Sad Shepherd*, remained a fragment He died at Westminster, and was buried in Westminster Abbey Of his songs the most famous is *Drink to Me Only with Thine Eyes* Consult the edition of his works by C H Herford and Percy Simpson (1925) and E C Dunn *Ben Jonson's Art* (1925)

**Jordaens, Jakob** (1593-1678), Flemish painter, was a native of Antwerp Second only to Rubens in the Antwerp school, and recognized as its leader after his death, he excelled especially in depicting humorous scenes from the life of the populace

**Jordan, The** (1) The largest river in Palestine, perhaps the most famous, and certainly one of the most remarkable of all rivers It is formed by the confluence of three streams from Mount Hermon, and pursues a due southerly course into the Dead Sea Its course is at first marshy, and after a run of some eight miles widens out into Lake Huleh, shortly below which the valley dips below sea level About twelve miles farther on is the Sea of Galilee or Lake of Gennesaret, from which to the Dead Sea is a stretch of sixty-five miles, through a valley of remarkable fertility, now known as El-Ghor—'the rift' The average rate of descent is nine feet per mile Well-known places in the valley are Bethabara, Bethshean, Pella, Succoth, Adam, Jericho, and Gilead Including the length of the Hasbany (40 m), the total course of the Jordan is about 200 m In 1918, during the World War, the British campaign in Palestine against the Turks centered on the banks of the Jordan, after the capture of Jericho (2) River, Utah On its bank is Salt Lake City

**Jordan, David Starr** (1851-1931), American naturalist and educator, born at Gainsville, N Y He early attracted attention as a naturalist, particularly as an ichthyologist, beginning the study of fishes under Louis Agassiz, and being an assistant to the U S Fish Commission (1877-91) After 1891 he was the first president of Leland Stanford, Jr, University at Palo Alto, Cal, becoming widely known as an educator In 1897 he was the U S commissioner in charge of the fur seal investigations Among his numerous publications are *Fishes of North and Middle America* (4 v 1896-9) and *Food and Game Fishes of North America*

(1902), *Classifications of Fishes* (1922), *The Tread of the American University* (1920)

**Jordan, Julius** ('Jules') (1850), American composer, was born at Willimantic, Conn. His most notable composition was an opera, *Rip Van Winkle* (1897), based on Irving's tale

**Jorgensen, Adolf Ditley** (1850-99), Danish historian, director of the Danish record office (1883), and in 1899 royal archivist. His works are remarkable for profound and patient research and charm of style. See *Bidrag til Vordens Historie i Middelalderet* (1871)

**Jorgensen, Jens Johannes** (1866), Danish author, born at Svendborg, the leader of the Danish symbolists who waged war against realism in their journal, *Taaet* (1893-5). His earlier works are remarkable for a curious combination of poetic naïveté and erotic realism, notably *Livets Tre* (1893) and *Hjemme* (1894)

**Joseffy, Raphael** (1852-1915), American musician and composer, was born at Hunfalu, Hungary, and began to receive lessons on the pianoforte at a very early age, appearing as a performer in public at Budapest when only ten years old. He subsequently studied at the Leipzig and Berlin conservatories, and with Liszt at Weimar, coming to New York in 1879 after a successful European career as a concert player. He assumed charge of the department of the piano at the New York National Conservatory

**Joseph** (1) Joseph, the eleventh son of Jacob, and the elder by Rachel, was the favorite of his father. His older brothers, out of jealousy, sold him to a company of merchants, who carried him to Egypt, and disposed of him as a slave to Potiphar, the captain of the guard. His trustworthiness soon secured him a place of honor in the household, but being falsely accused by Potiphar's wife, he was thrown into prison. His skill in interpreting the king's dream brought about his release, and he rose in a short while to the position of Pharaoh's chief minister. By his foresight he was able to preserve the country through seven years' failure of crops, and was the means of bringing his father and brethren to Egypt, the region of Goshen being assigned to them. (2) Joseph, the husband of Mary the mother of Jesus, is mentioned in the New Testament only in the stories of the birth of Jesus, in the episode in the temple when Jesus was twelve years old, and in John 1:45, 6:42. He is described as a descendant of David and a resident of Nazareth. That he was a carpenter is an inference from Matt. 13:55. (3) Joseph of Arimathea was a wealthy Jew, who begged from Pilate the body of Jesus and buried it in his own grounds

**Joseph I** (1678-1711), emperor of Germany, of the house of Hapsburg, and son of Leopold I, born at Vienna, was proclaimed king of Hungary (1687), and king of the Romans (1690), succeeding his father as German emperor (1705). He carried on a successful war, with the assistance of England, Holland, and Savoy, against Louis XIV.

**Joseph II** (1741-90), emperor of Germany, son of Francis of Lorraine and Maria Theresa, born in Vienna, was elected king of the Romans (1764), succeeding his father as German emperor (1765). Along with the sovereigns of Russia and Prussia, he signed the treaty by which Poland was divided among them (1772). On the death of his mother (1780) he came into possession of the Austrian throne. He helped in the suppression of the Jesuits, established religious toleration in his dominions (1781), his zeal in correcting the abuses of the Roman Catholic Church caused an insurrection in Belgium, and the same thing happened in Hungary over his attempt to establish German as the universal language in his dominions.

**Joseph, King of Naples**. See Bonapartes, The

**Joséphine, Marie Rose** (1763-1814), wife of Napoleon I, and empress of France, was born at Martinique, her maiden name being Tascher de la Pagerie. She first married Vicomte Alexandre Berthier (1770), who was guillotined during the reign of terror, then Bonaparte (1796). She exercised a profound influence over the emperor. Her union with Napoleon proving without issue, was dissolved in 1809, to enable him to marry Marie Louise of Austria.

**Josephus, Flavius** (37 c. 100 A.D.), Jewish historian, was a man of high birth, and was sent on a mission to Rome in 63 A.D. When the Roman governor left Jerusalem, he accepted the management of affairs in Galilee, and defended Jotapata for forty-seven days against Vespasian. Titus interceded for him, and his life was spared, but he was not released from custody until Vespasian was declared emperor in 70 A.D. His chief works are *The History of the Jewish War*, and *The Jewish Antiquities*.

**Joshua** ('Jesus'), the son of Nun, according to the book called by his name, succeeded Moses as the leader of the Israelites, and completed the invasion of Canaan.

**Joshua, The Book of**, describing the Israelite conquest of Canaan, is now regarded as the necessary supplement to the Pentateuch, and in critical works the six books are conjoined under the name of Hexateuch.

**Josiah**, king of Judah (c 639-608 B C), the son and successor of Amon, ascended the throne at the age of eight. The Scythian invasion in 630 was interpreted as a divine judgment upon the idolatry of the nation, and shortly thereafter Josiah, assuming the regal authority, began his campaign of reform. While the temple was being renovated by public subscriptions, the book of the law (Deuteronomy) was discovered by the high priest Hilkiah, and this gave a startling impetus to the progress of the reforming movement.

**Jósika, Baron Miklós** (1796-1865), Hungarian novelist, was born at Torda in Transylvania, and wrote a series of romances historical and social, based on the model set by Sir Walter Scott. They achieved great popularity. Chief amongst them are *Abafi* (1836), *The Bohemians in Hungary*, *The Last of the Báthoris* (1847).

**Jost, Isaak Markus** (1793-1860), Jewish historian, born at Bernburg in Anhalt. He is chiefly remembered for his *Geschichte der Israeliten* (1820-29), which he continued in *Neuere Geschichte der Israeliten von 1815-45* (1846-7).

**Jotun**, a legendary being of North European folklore. In the translations of the Scandinavian *Eddas*, where the jotuns figure prominently, their name is usually rendered by 'giant'.

**Joubert, Petrus Jacobus** (1834-1900), Boer commandant, was born at Congo in Cape Colony. He worked with Kruger against the annexation of the Transvaal by Sir T. Shepstone in 1877. When the flag of independence was raised in December 1880, he was appointed one of the triumvirate to whom the government of the country was entrusted. As commandant-general of the Boer forces he defeated the British at Majuba Hill on Feb. 28, 1881. On the outbreak of the Boer war (1899-1902) Joubert was again commandant-general, and invested Ladysmith, but ill-health compelled him to return to Pretoria, where he died.

**Jouett, Matthew Harris** (1788-1827), American artist, the son of a Revolutionary patriot, was born in Mercer co., Ky. He lived at Lexington, Ky., where and in other parts of the South he painted many portraits of which the best known is that of Lafayette, ordered by the Kentucky legislature.

**Joule** is the practical electric unit of work, it equals  $10^7$  C.G.S. electro-magnetic units of work or ergs, and represents the work done or heat generated by a watt per second, or an ampere flowing through an ohm in a second, or a coulomb passing through the P.D. of one volt. Taking Joule's equivalent (see THERMODYNAMICS) as  $41.6 \times 10^6$  in the C.G.S. system then

the Joule being  $10^7$  ergs is the amount of heat required to raise 24 gram water  $1^\circ$  C.

**Joule, James Prescott** (1818-89), English physicist, was born at Salford, and became a pupil of Dalton. His first work was on magnetism—a research which led to a definition of a practical unit of current, and to his discovery that the quantity of heat set free by the passage of a current through a conductor is proportional to the square of the current. These investigations in their turn paved the way for Joule's great discovery in 1843 of the mechanical equivalent of heat.

**Jourdan, Jean Baptiste, Count** (1762-1833), French military commander, born at Limoges. Napoleon entrusted him with the direction of affairs in Piedmont (1800). He was created a marshal in 1804, and in 1806 was appointed governor of Naples.

**Journal**, the cylindrical supporting parts of a horizontal revolving shaft, frequently made of length about one and a half diameters. In lines of shafting it is often made of length about four diameters.

**Journal des Débats, Le**, a French journal of moderate republican opinions, was founded in 1789 to report the proceedings of the National Convention.

**Journalism**. Definitions of modern journalism agree in describing it as the business of gathering and publishing current news for periodicals, or, more narrowly, and in deference to the later phases of its development in limiting that business to the requirements of a daily newspaper. In the United States journalism has progressed along lines freer from interference than in European countries. In colonial days there were a few suppressions of newspapers by arbitrary governors, and after the organization of the Federal Government, the Alien and Sedition Acts, passed during the administration of President John Adams, and designed to meet virulent political opposition, imposed certain restrictions on the public press. But these interruptions—for they could be called nothing more serious—were only temporary. Both before and after the Revolution, popular sentiment was so overwhelmingly opposed to any tampering with the free printed utterances of the people that no attempt in that direction was tolerated. The jury in Zenger's case, in acquitting the defendant, expressed a deep-rooted popular conviction, and President Adams's vigorous measures, though operative only during 1798-1801, aroused a fierce opposition that went far to overthrow the Federalist party. Henceforth American journalism, free from any trammels

beyond libel laws which have generally been construed on the side of liberty of opinion, developed under all the favorable conditions that immense natural resources, an expanding population, and a liberal support of public schools could supply. During the moral agitation that resulted in the civil war the editorial office was most commanding. Men like Horace Greeley, Thurlow Weed, and Henry Raymond belonged to an order that existing conditions have made almost impossible. It is none the less true that public opinion in this country is more independent and discriminating than during the first half of the 19th century, more likely to resist any perverting leadership, and doubtless that result is itself due, in large measure, to the educative power of journalism. See **NEWSPAPER**.

#### Joust See Tournament

**Joutel, Henri** (c. 1650-?), a French explorer in America, born at Rouen, France. He was a friend and fellow-townsmen of the explorer La Salle, whom he accompanied on the expedition of 1685-7, which resulted in the establishment of a temporary colony in Texas and finally in La Salle's assassination. He finally (in July, 1687), after what Parkman calls 'one of the most adventurous journeys on record,' reached Montreal by way of the Arkansas, the Mississippi and the Illinois.

#### Jove See Jupiter

**Jovellanos, Gaspar Melchor de** (1744-1811), Spanish author and statesman, born at Gijón. He was a very prolific writer of political and economic works, greatly esteemed both for style and matter, and also of verse and poetic dramas. *El Delincuente Honrado* and *El Pelayo* are his principal plays, and *Mejico Conquistada* his best-known epic.

**Jovian**, whose full name was **Flavius Claudius Jovianus**, was emperor of Rome from June, 363, to February, 364 A.D. He promulgated the famous edict which placed the Christian religion on a legal basis, thus putting an end to Julian's persecution.

**Jowett, Benjamin** (1817-93), tutor and master of Balliol College, Oxford (1870), exercised a great influence over the intellectual life of Oxford. He is noted for his translation of the *Dialogues of Plato* (4 vols. 1871).

**Joyce, James** (1882-1941), Irish novelist, began his career with the poems of *Chamber Music* (1907). His masterpiece, *Ulysses* (1922), aroused great discussion and antagonism by its originality and boldness. Joyce is probably the chief of what are called the 'moderns' in literature. He has been engaged for years on a kind of companion work to

*Ulysses*, known as *Work in Progress*. After parts of *Work in Progress* had been published in the esoteric literary journals, the book appeared in virtually its final form in 1936. In the latter part of 1934, the ban on his *Ulysses* was lifted by the U.S. after much litigation in the federal courts. In 1935, a three act play, *Exiles*, was issued. See Budgen's *James Joyce* (1934).

**Juan Fernandez**, group of three volcanic islands, on one of which (María-Tierra) Alexander Selkirk was marooned in 1704-9, in the Pacific Ocean, about 380 m. W. of Valparaiso, Chile. Selkirk's adventures are said to have suggested *Robinson Crusoe* to Defoe.

**Juan Manuel** (1282-1347), grandson of Ferdinand III of Castile. He wrote chronicles and treatises, and, best known of all, *Libro de los Estados*. But his masterpiece is *Count Lucanor* (Eng. trans. 1888), a collection of amusing moral tales or apologies resembling the *Arabian Nights*.

**Juarez, Benito Pablo** (1806-72), president of Mexico, born of Indian parentage, at Guadalupe, in the state of Oaxaca, of which he was governor (1847-52). Forced in 1853 to leave Mexico during Santa Anna's ascendancy, he returned in 1855 to join Alvarez, became minister of justice (1855), and secretary of the interior and chief-justice (1857), and finally was elected president in 1858. However he was compelled to retire to Vera Cruz, where his government was recognized by the United States in 1859. He was able to enter the capital in January, 1861, and in March was elected president for four years, being re-elected in 1867 and in 1871.

**Juarez-Celman, Miguel** (1844- ), South American politician, was born in Cordoba, Argentina. As a member of the Liberal party he served in the national senate, and was elected president of the republic, 1886. His administration was marked by wild speculation and dishonesty on the part of those in charge of public funds, and he was obliged to resign in 1890. He passed into obscurity.

**Juba** (1) King of Numidia from about 61 to 46 B.C. In the civil war between Caesar and Pompey he took the latter's side, and after the battle of Thapsus, which Caesar won, committed suicide. (2) Son of the above (d. c. 19 A.D.). Caesar took him to Rome as a child. There he gained the favor of Augustus, who in 30 B.C. restored him to his father's throne.

**Jubilate**, the 100th Psalm, which begins with that word in the Vulgate version. It is used as an alternative canticle for the *Benedictus* at morning service.

**Jubilee**, the 50th anniversary of any important public event, or the 50th year of any important institution. The 60th anniversary is termed the 'diamond jubilee.' The word comes from the Hebrew 'Year of Jubilee,' which is described in the Holiness Code. As here instituted it recurred at intervals of seven sabbatical years (7x7 years), was ushered in by the blowing of the *shofar*, 'ram's horn,' and was celebrated with universal rejoicing. In the Roman Catholic Church a jubilee feast was instituted by Boniface VIII in 1300, and was intended to recur with every new century thereafter, but the interval was successively reduced by later popes to fifty, thirty-three, and twenty-five years.

**Jubilees**, **The Book of**, one of the Old Testament Apocrypha, called also the Little Genesis. The former name is due to the fact that the book divides the whole stretch of time between the creation and the arrival of the Israelites in Canaan into fifty jubilees of forty-nine years each, and describes the various incidents in this period by reference to the particular sabbatic year and jubilee in which it occurred. The other name of the book arises from its being a recast of the narrative given in Genesis, though, while it only gives a selection of the events, its lengthy comments and Midrashic legends actually swell it beyond the compass of the canonical book.

**Judaea**, or **Judea**, the southernmost district of Palestine in the time of Christ.

**Judah**, the fourth son of Jacob, and the eponymous ancestor of the tribe of the same name.

**Judah ha-Levi** (c. 1085-after 1140), Jewish philosopher, poet, and physician, born at Toledo in Spain, was the greatest mediæval poet who wrote in Hebrew. Heine pays a fine tribute to him in his *Romanzero*. Nina Davis translated some of his poems as *Songs of Exile* (1901).

**Judaizers**, those early Christian Jews who maintained that the sole difference between Christians and Jews was the acknowledgment on the part of the former that Jesus was the Messiah. They desired to force even upon the heathen converts of the new faith the observances of the Mosaic law, and this explains their extraordinary hostility towards Paul, who advocated Christianity without observance of the Jewish forms.

**Judas Iscariot**, one of the disciples of Jesus, and His betrayer, is believed to have belonged to the village of Kerioth, whence his surname, 'Ish-Kariyoth—'man of Kariyoth,' now El-Karijetein in South Judah. When he became a

disciple, he was chosen to carry and administer the funds. He displayed a grasping disposition and ultimately betrayed Jesus to the Jewish authorities for thirty pieces of silver. Overcome with remorse at the dreadful outcome of his crime, he committed suicide.

**Judas Maccabæus**, the deliverer of the Jews from the Syrian yoke in the reign of Antiochus Epiphanes, was the third son of Mattathias, the priest who began the revolt. Judas had every gift of a great general—bodily strength, ready judgment, power of organizing, courage, zeal, and, above all, faith—and is to be regarded as one of the most heroic figures in the history of Israel. His career forms the subject of one of Handel's greatest oratorios, *Judas Maccabæus*.

**Judas Tree**, a name sometimes applied to the elder tree, and to various trees belonging to the leguminous genus *Cercis*, each in turn reported to be the tree on which Judas hanged himself. The European *C. siliquastrum* is the species most frequently meant, and the name has been transferred to the American representative of the genus *Cercis*, *C. canadensis*, most common in the Middle States, where it reaches a height of about 50 ft., and a trunk diameter of 1 ft. The pink-purple, papilionaceous flowers appear in profusion before the foliage.

**Judd**, **Norman Buell** (1815-78), American lawyer, politician, and diplomatist, born at Rome, N. Y. Removing to Chicago (1836) he drafted the first charter of that city (1837), became prominent as a lawyer and took an active part in politics first as a Democrat and afterwards as a Republican. He was U. S. minister to Prussia during all the Civil War period (1861-5).

**Judd**, **Orange** (1822-92), American editor and publisher, was born near Niagara Falls, N. Y. He was editor of the *American Agriculturalist* (1853-83), of which he became proprietor in 1856. He removed to Chicago, 1883, and there established the *Orange Judd Farmer* and the company by which it is published. He founded the Hall of Natural Science at Wesleyan (1871).

**Judd**, **Sylvester** (1813-53), American author. His first creative work was the well-known novel *Margaret, a Tale of the Real and Ideal* (1845), an 'attempt to fill up a gap long left open in Unitarian literature—that of imaginative writings.' Judd was prominent as an advocate of temperance, anti-slavery and other reforms.

**Jude**, **The Epistle of**, one of the shortest of the New Testament books, purports to have

been written by 'Jude (Judas), the brother of James' he would thus be one of the 'brethren of the Lord' The letter is addressed to Christian saints in general, and is mainly composed of warnings against false teachers

**Judge** In our legal system, the presiding officer of a court of justice As the administration of justice involves the determination both of questions of law and of fact, the same person or group of persons may perform both functions, or the two may be separated, questions of law being decided by one man or set of men and questions of fact, in whole or in part, by another Such persons, however numerous they may be, are known as judges The great power and divinity of the judicial office are recognized in the care exercised in every civilized country to secure fit men to perform its duties Judges are in Great Britain and the United States almost invariably selected from the legal profession and are protected by the bar in the exercise of their high office In this country the practice of filling the judicial office varies The Judges of the United States Supreme Court and of the circuit and district courts are appointed by the President subject to confirmation by the Senate In some of the states all judges of record are appointed by the governor, whereas in many, if not most, of them all judges of whatever degree are elected by the people In the federal system and in some of the states judges hold office for life, but in most states for a fixed term of years The modern tendency is to give all the higher judges a long tenure of office and to render them entirely independent of partisan politics In the United States judges are removable by impeachment and, in some if not all of the states, by vote of the legislature

**Judge, William Quan** (1851-96), Irish-American theosophist, born in Dublin He came to the United States when 13 years old, and was admitted to the bar in New York, 1872 With Mme Blavatsky and H S Olcott he founded the Theosophical Society of America

**Judge Advocate**, the prosecutor of a general or garrison court-martial or a military commission, detailed and published as such in the U S army in the order constituting the court, usually from the line of the army, but in cases of the trial of officers of high rank or other trials of special importance, from among the officers of the permanent staff of the Judge Advocate General's Department His duties are accurately defined by military law and customs of the service from which he may not depart

#### **Judge Advocate General's Department**

A bureau of military justice of the War Department headed by the Judge Advocate General with rank of brigadier-general and consisting of two Judge Advocates with rank of colonel, three with rank of lieutenant-colonel and six with rank of major When called upon to do so by proper authority, the officers of this department explain the law and give opinions upon legal questions, being law officers of the War Department as far as concerns military law

**Judges, The Book of**, purports to narrate the history of Israel from the death of Joshua till the time of Samuel After an introduction giving an account of the subjugation of Canaan differing from that in the Book of Joshua, it gives the histories of the several 'judges' in their long protracted struggle with internal or external foes The book shows a relatively simple structure Parts of the book, notably the song of Deborah, are undoubtedly very ancient, and the compiler, writing after the captivity of the ten tribes seems to have availed himself of written sources throughout

**Judges' Cave**, New Haven, Conn The hiding place of Goffe and Whalley, regicides, in 1661

**Judgment**, in psychology, is the mental act by or in which a predicate is affirmed or denied of a subject, in logic, the affirmation or denial itself, which, as expressed in language, is called a proposition Judgment so defined is the unit of all thought, for definite thinking is made up of judgments, and short of judgment there can be neither truth nor falsity An idea is in itself neither true nor false, it becomes so only as referred implicitly or explicitly to a subject

**Judgment** The judicial determination of a cause by a court of justice Such determination may settle conclusively all the issues involved in an action, in which case it is denominated a *final* judgment, or it may settle some of the issues raised, leaving one or more unsettled, or may determine the issues between the parties, leaving the extent or nature of the remedy undetermined, when it is known as an *interlocutory* judgment The judgment is the final act of the court in a cause, the enforcement of a judgment by execution being an administrative and not a judicial proceeding

**Judgment, The Last**, in Christian theology, the final determination of the destinies of men, to be made at the last day In the Old Testament the 'day of Jahweh' was awaited as the time of Israel's salvation, but in the mouth of Amos it becomes a day of judgment, which will sift even the chosen na

tion, and bring to destruction all that is unworthy. When the belief in a personal resurrection had been fully developed, as in New Testament times, we find Jesus represented as speaking of a tremendous crisis, both for the world and for individuals, which is to take place at the end of the age, when He will return, and bring the living and the dead before Him for final arbitrament. There seems little doubt that this transaction is represented in Scripture as an event—the *day of judgment*.

**Judicature Acts** The successive enactments of the years 1873-1881, by which the judicial system of England was reformed. The Acts did little more than put into effect in England reforms which had already been made in the judicial systems and procedure of many of the United States.

was graduated from Brown University (1807) and from Andover Theological Seminary (1810). He labored at Rangoon, Ava, Maulmain, and in other parts of Burma, issuing a translation of the Bible into Burmese (1835), and a *Burmese and English Dictionary*, published (1852) after his death.

**Judson, Harry Pratt** (1849-1927), American educator, was born in Jamestown, N. Y. He was graduated from Williams College (1870, A. M. 1883, LL. D., 1893). In 1892 he became connected with the University of Chicago, which he served as professor of political science (1892-4), head dean of the colleges (1892-4), head of the department of political science (1894-1923), dean of the faculties of arts, literature, and science (1894-1907), president (1907-1923), and after 1923 president



*Juglans Butternut (Juglans cinerea) Trees and spray of blossoms*

**Judith, The Book of**, one of the Old Testament Apocrypha. It records how Holofernes, at the head of 132,000 troops, had been commissioned by Nebuchadnezzar to take vengeance on the countries, including Judæa, which had not aided the king in the war against the Medes, and how, while he was besieging Bethulia, Judith, a Jewish widow, gained access to him by her beauty, and, having drugged him with wine, cut off his head—a deed which emboldened the Jews to fall upon the leaderless Assyrians, who were routed with immense slaughter. The work probably originated in the 1st century B. C.

**Judith**, an Old English epic fragment of about 350 lines, containing one of the spirited battlepieces for which Old English poetry is justly famous.

**Judson, Adoniram** (1788-1850), American missionary, was born in Malden, Mass. He

was chairman of the China Medical Commission of the Rockefeller Foundation in 1914, and Director of the Commission on Relief in the Near East (1918-19). His publications include many works on political history and political science, notably *Europe in the Nineteenth Century* (1894, 1901), *The Growth of the American Nation* (1895-1906), *The Essential Elements of a Written Constitution* (1903), *Our Federal Republic* (1925).

**Juengling, Frederick** (1846-89), American engraver and artist, was born in Leipzig, Germany. He came to America in 1866, and established an engraving firm of his own at New York (1871), which secured an extensive patronage. After 1879 Juengling devoted himself to painting. One of his best-known etchings is *Portrait of J. McNeill Whistler*, after Whistler's painting.

**Juggling**, a form of entertainment consist-

ing chiefly of feats of skill in tossing balls, plates, tops, knives etc. The Chinese and Japanese are especially successful in the art as it is now practised.

**Juglandaceae**, a family of shrubs and trees, mostly native to North America, including *Juglans* (the walnuts) and *Hicoria* (the hickories), some of which are of economic importance for their wood and their fruit.

**Jugoslavia** See *Yugoslavia*

**Jugo Slavs** See *Yugoslavia*

**Jugular Veins**, a name applied to certain large veins of the neck. Cases of death occurring within a few seconds of the 'jugular' being severed may be attributed to wounds of the carotid, but a slower form of death often follows a wound of one of the jugular veins, and is due to the admission of air through the opened vein to the cardiac chambers.

**Jugurtha** (d. 104 B.C.), king of Numidia, was the grandson of Masinissa.

**Ju Jitsu**, or **Jiu Jitsu**, the Japanese art of self defence, is of great antiquity, but until recent years was practised only by the Samurai, the governing and military caste of Japan. In the late Japanese renaissance much wider functions were given to it, originally for self-defence purely, it came to be valued as a means to health and general physical efficiency, and, finally, in the development of character, and the training was thrown open to the whole people.

Ju-jitsu means literally 'the gentle art'. It opposes knowledge and skill to brute strength, and seeks to make man independent of weapons and mere physical force, its principle being to use a man's weight and strength against himself. An opponent's blow that cannot be resisted can be turned to his own downfall.

The first thing that must be learned is the art of falling without shock or injury. The natural man usually falls on a joint—i.e. on the base of the spine, the elbow-joint, or the wrist. In the ju-jitsu method of falling, the violence of the shock is taken by pads of muscle on the arm, leg, or foot.

The reader is advised that the complicated nature of many ju-jitsu movements renders the practice of them undesirable until the beginner has grasped the simple elementary principles upon which all of them are based. See *Shimizu's Ju-Jitsu* (1905), Hancock and Hirst's *The Complete Karo Ju Jitsu* (1905), and Kuriyama and Welch's *Judo* (1903).

**Ju-Ju**, a name given by West Africans to any fetish, whether an idol, or a medicine or anything else used as a charm.

**Jujuy** Province in n.w. of Argentina, bordering on Bolivia.

**Jujuy River**, or **Rio Grande de Jujuy**, Argentine Republic. It rises near boundary of Bolivia, and flows into the Vermejo after a course s. and e. of c. 300 m.

**Jukes**, The, a fictitious name given to a family which formed the subject of an exhaustive study in heredity and criminology, as its members manifested a striking disposition to crime, depravity, disease and pauperism. This scientific inquiry was undertaken under the direction of the Prison Association of New York, and revealed the fact that this single family in seventy-five years had cost the community some \$1,308,000. It originated from the marriage of two brothers of Dutch descent with two sisters who are known as 'The Jukes Sisters'. Of 1,200 descendants, some 709 were investigated, and it was found that of this number 140 were criminals and offenders, having spent an aggregate of 140 years in prisons and jails. The investigation was made by R. L. Dugdale.

**Jukes, Joseph Beete** (1811-69), English geologist, born at Summerhill, Birmingham, studied under Sedgwick at Cambridge. He was director of the Geological Survey in Ireland (1850), and lecturer at the Royal College of Science, Dublin.

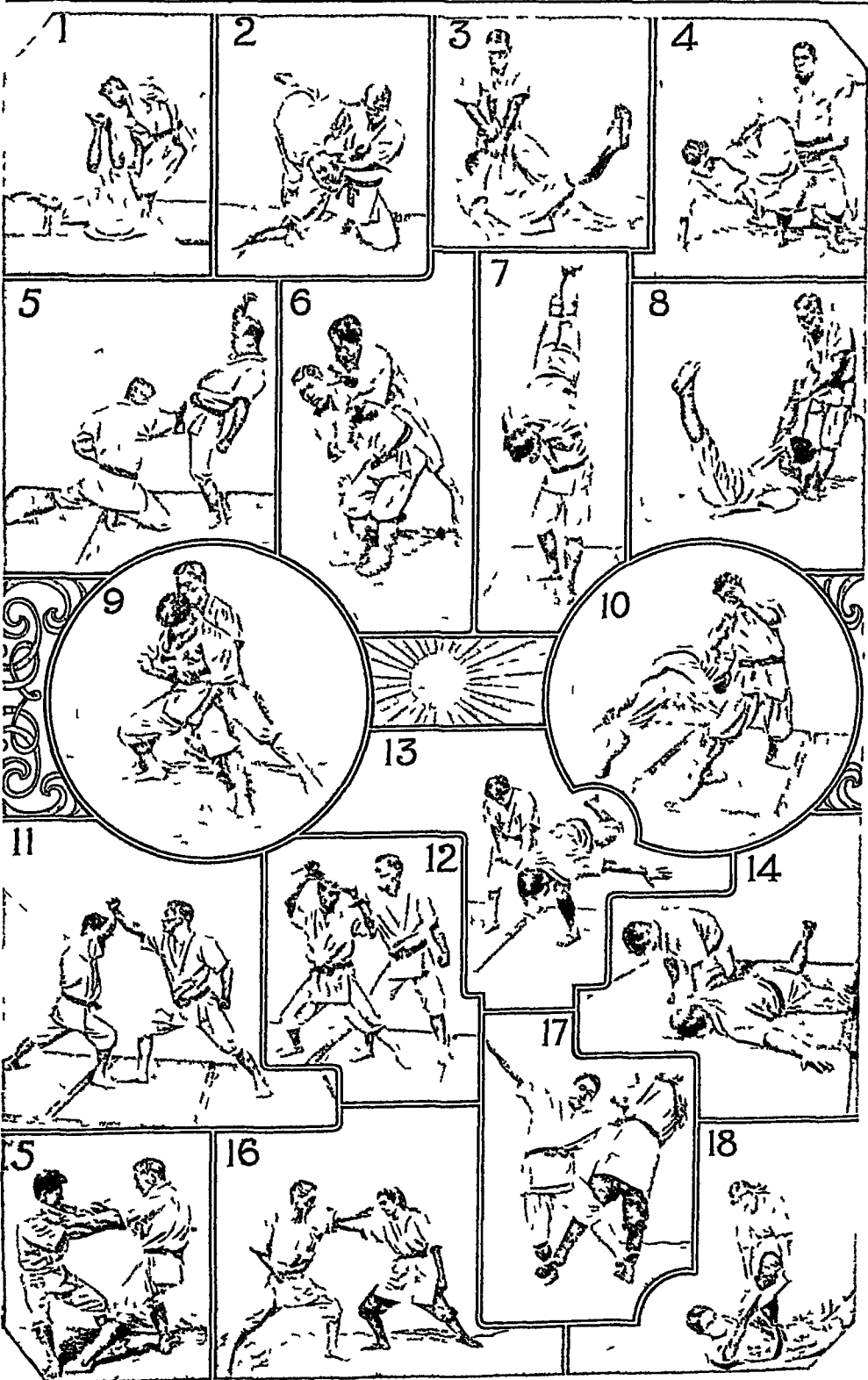
**Julg, Bernhard** (1825-86), German philologist, born at Ringelbach in Baden, was professor of classical philology at Lemberg (1851-3), Cracow (1853-63), and Innsbruck (1863, until his death). He was one of the greatest European folklorists of modern times.

**Julia**, several ladies of the Julian clan at Rome. (1) The sister of Julius Caesar, was the grandmother of Augustus. (2) Julius Caesar's daughter, married Pompey in 59 B.C., and died in childhood in 54. (3) The daughter of Augustus, by Scribonia. (4) Daughter of the above, she married L. Aemilius Paulus.

**Julia gens**, the Julian clan, a famous house in ancient Rome, which claimed its descent from Iulus, the son of Aeneas and so from Venus.

**Julian**, whose full name was **Flavius Claudius Julianus** (331-36 A.D.) surnamed the Apostate, was the son of Julius Constantius, and nephew of Constantine the Great. He and his elder brother Gallus alone of the imperial family were spared by Constantius when on his accession he massacred all the descendants of Constantius Chlorus by Theodora. In 360 his soldiers proclaimed him emperor, but on Nov. 2, 361, Constantius died





and Julian was left undisputed emperor. Julian was a ruler of great ability, and a very prolific writer on all sorts of subjects.

**Julian, George Washington** (1817-99), American political leader, born near Centerville, Ind. He was admitted to the Indian bar in 1840 and practiced law with success, but gave much of his attention to politics, and, sharing the anti-slavery views of his father-in-law, Joshua Reed Giddings, was one of the most prominent of the political abolitionists before the Civil War. He was one of the organizers of the Republican Party in Indiana and sat in Congress as a Republican (1861-71). In 1864 he was one of those who opposed the re-nomination of President Lincoln. In 1872 he joined the Liberal Republican revolt against President Grant and supported Horace Greeley for the presidency.

**Julier Pass** (7,504 ft) is in the Swiss canton of the Grisons, and by carriage road connects the Rhine and Inn valleys. It is now superseded by the railway under the Albula Pass (opened 1903).

**Julius I** (337-352), pope, born at Rome, was a vigorous supporter of Athanasius against the Arians.

**Julius II, Giuliano della Rovere** (1443-1513), was nephew of Sixtus IV, and was chosen pope (1503). A great fighter and successful politician rather than an ecclesiastic, he recovered Romagna from the Borgias, and devoted all his energies to the re-establishment of the papal sovereignty and the extinction of foreign domination in Italy.

**Julius III, Giovanni Maria del Monte** (1467-1555), was elected pope in 1550. He favored the Jesuits, freeing the order from many disqualifications, and sent Cardinal Pole to arrange with Mary of England the best means of bringing the English Church and kingdom once more within the pale of Rome.

**Jumna, Jamna, or Jamuna**, river of India, the chief affluent of the Upper Ganges, has its source on the S. slopes of the Western Himalayas at a height of 12,000 ft. The chief cities on its banks are Delhi, Agra, Iroori, Multan and Allahabad.

**Jumping Hare, or Springhaas**, a large African jerboa (*Peletes caffer*). The animal inhabits both the plains and the mountains of South Africa, and is especially common in Cape Colony.

**Jumping Mouse** (*Zapus leucurus*), North American jerboa-like mouse, with long hind legs and a long tail, and five complete toes on the hind foot. It dwells in open grassy places.

**Junagarh**, feudatory state in Kathiawar, Gujarat, India, with an area of 3,283 sq. m., and a population of half a million. Cotton and cereals are grown.

**Junco**, any of the 'blue snowbirds' of the genus *Junco*, several species of which are scattered locally throughout the United States and Canada. They are small, finch-like birds, with plumage prevalently slateblue on the upper parts and white on the breast and below, while western species show chestnut tinges on the back and wings, the backs and feet are pale pink. There is but one kind common in the East—*Junco hiemalis*.

**Juncus**, a genus of grasslike herbs growing in boggy places. These are the true rushes and are extensively used for making mats, especially in Japan.



The Jungfrau, from Interlaken

**Juneau**, capital of the Territory of Alaska, situated at the headwaters of the Gastineau Channel, opposite Douglas Island. It is a mining and fishing town and a base of supplies for the mining and other interests of that region, as well as a mail distributing center for all points westward. There are various manufacturing concerns, such as lumber products, beer, cigars, etc., and the general trade of the vicinity supports a considerable number of wholesale and retail stores. In the vicinity are the famous Treadwell gold mine and the Silver Bow mines, p. 57-9.

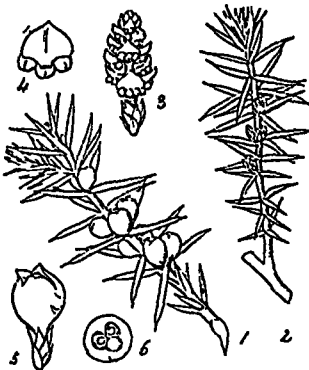
**June Beetle**, a green and brown cottony beetle (*Illorissa viridis*) of the southern United States, which feeds upon all sorts of soft fruits,

and sometimes is so numerous as to damage notably figs, perches, and the like

**Jung, Dr Carl Gustave** (1875- ), psychologist and associate of Sigmund Freud, established a world famous psychiatric clinic at Zurich, Switzerland Jung regarded the psychoanalyst as a confessor who relieved his patient of suppressed feelings by bringing them from the realm of the unconscious mind into the consciousness His books included *Psychology of the Unconscious* (1916), *The Integration of the Personality* (1939)

**Jungfrau**, Alpine peak, the third in height (13,669 ft) among the Bernese Oberland peaks, owes its name to the legend that no one could defile the snows of the 'virgin' peak, but it was ascended in 1811 by J R and H Meyer

**Jungle**, or **Jangal**, literally 'waste,' is now applied to land covered with dense, luxuriant vegetation, such as long grass or undergrowth It has also been used to signify the dense inter-tropical forest



*Common Juniper*

1, Juniper, with fruit, 2, with male flowers, 3, male catkin, 4, anthers, 5, ripe fruit, 6, section

**Jungle-fowl**, a general name for the members of the genus *Gallus* The red jungle-fowl, *G ferrugineus*, is the origin of the domesticated breeds of poultry It inhabits India, Farther India, Sumatra, the Philippines, Celebes, and Timor

**Junia Gens**, the Junian clan of ancient Rome To it belonged Lucius Junius Brutus, who expelled the kings, and the famous Brutus who murdered Cæsar

**Juniata College**, a coeducational institution at Huntingdon, Pa., established in 1876 as the Brethren's Normal School and Collegiate Institute for children of the Dunker Brethren

**Church** In 1896 it was rechartered under its present title

**Juniata River**, Pa., has its sources in the Alleghenies, takes a generally e though very circuitous course, through beautiful scenery, and flows into the Susquehanna river at Duncannon

**Juniper** (*Juniperus*), a genus of hardy, evergreen, coniferous trees, with inconspicuous, dioecious flowers—the male in scaly catkins, the female in small globose cones—scale like or needle-like leaves, and with berry-like fruit The common juniper, *J communis*, is widely distributed throughout the northern hemisphere, with many varieties The blue fruits of the common juniper are used in the making of hollands and other varieties of gin, and also in medicine, an oil being distilled from them which has a warm, aromatic taste and the characteristic odor of juniper

**Junipero, Miguel José Serra** (1713-84), Spanish Franciscan missionary, the founder of the California missions, born on the Island of Majorca He went from Spain to the City of Mexico (1750), was a missionary to the Sierra Gorda tribes of Indians (1750-69), was placed in charge of the missions of Lower California (1769), and in the same year, at San Diego, founded the first of the missions in Upper California—the territory which forms the present State of California

**Junk**, the name of the native Chinese vessel It is a clumsy craft, with very high forecastle and poop, and pole masts carrying square sails of matting, and is slow and awkward to handle

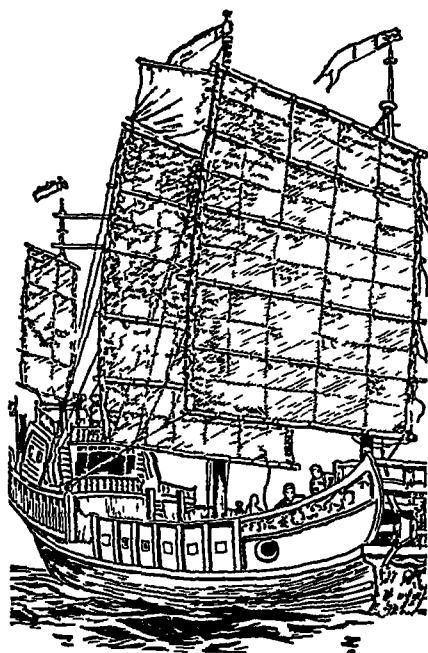
**Juno**, the third asteroid, discovered by Harding at Lihenthal, Sept 2, 1804 It has a diameter of 120 m (Barnard), and an albedo of 0.45

**Juno**, the chief goddess of ancient Rome, was identified with the Greek Hera As a Roman goddess Juno is the counterpart of Jupiter, thus she was regarded as the queen of heaven She was the especial protectress of the female sex She also was the guardian of the finances of the state, and as Juno Moneta had a temple which contained the mint at Rome

**Junot, Andoche, Duc d'Abrantes** (1771-1813), French general, born at Bussy-le-Grand, served under Napoleon in Italy, subsequently accompanying him to Egypt (1798) In 1804 he became ambassador to Portugal, but left Lisbon to join Napoleon in Germany Placed in command of an army for the invasion of Portugal (1807), his brilliant manoeuvres, culminating in a successful dash upon Lisbon,

won for him the governorship of Portugal, and the title of Duc d'Abrantes, but after a time he was forced by Wellington to leave the country

**Junta**, the name given in Spain to any body of men united together for administrative or political purposes, whether it be an official or a spontaneous and unofficial gathering. During the late Cuban insurrection a so-called junta was maintained in the United States with headquarters in New York City, to assist the revolutionists by the provision of funds and arms, as well as by arousing the public sentiment of the American people generally. T. Estrada Palma, who was the recognized head of this body, became the first president of Cuba after its independence.



*Chinese Junk*

**Jupiter**, the chief god of ancient Rome. He was the son of Saturn and Rhea, and brother and husband of Juno. As the greatest of the gods he was known as Optumus Maximus—'best and greatest'. He was held to be the especial guardian of Rome.

**Jupiter**, the largest planet in the solar system, has a mean diameter of 86,500 m. Its mass is 316, its volume 1,300 times that of the earth. Gravity exerts at its surface 2.5-8 its power upon the earth, hence the specific lightness of the globe suggests that it is greatly

distended by internal heat. The planet revolves round the sun in a period of 11.86 years, at a mean distance of 483 million miles. When in opposition about October 6, being then at perihelion, it is 42 million miles nearer to the earth than at aphelion oppositions in April, and shines with five or six times the luster of Sirius. Jupiter has eight satellites—four outer ones discovered by Galileo in 1610, an inner minute one by Barnard at Lick in Sept., 1892, two faint exterior attendants by Perrine in 1904-5, and an eighth by Melotte at Greenwich in 1908. His 'comet-family' consists of thirty-two known members, probably introduced into the solar system by his influence.

**Jura**, island, Inner Hebrides, Argyllshire, Scotland, separated from Islay by the Sound of Islay, from the mainland by the Sound of Jura, and from Scarba by the dangerous strait of Cornevrackin.

**Jura**, department (area 1,951 sq. m.), France, bounded on the e. by Switzerland, is divided into three regions. Grain and potatoes are cultivated, the vine flourishes, cattle are pastured in the mountain region, and Gruyere cheese is a noted manufacture.

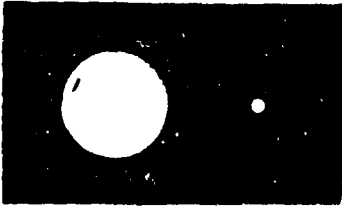
**Jura Mountains**, The, stretch in a curve for about 190 m. in a northeasterly direction through the French departments of Ain, Jura, and Doubs, and the Swiss cantons of Vaud, Neuchâtel, and Bern. It is made up of seven parallel chains, with an average height of from 2,000 to 2,500 ft., and is composed, especially on the French side, of Jurassic limestone.

**Jurassic System**, the division of geological strata following the Triassic and immediately preceding the Cretaceous. The system derives its name from the Jura Mountains in Switzerland, which are largely built up of rocks of this group. In America the Jurassic strata are developed on a comparatively small scale. Their presence has not been definitely established in the eastern part, but they are known to occur in Colorado, Wyoming, New Mexico and Arizona and on the Pacific coast. Owing to the fact that they cannot always be differentiated from the Triassic, the two systems are in America generally grouped together as the Jura-Trias.

The association of animal types is that which is characteristic of the Mesozoic epochs. Molluscs of all kinds are abundantly preserved in the limestones. Among the plants cycads seem to have predominated. Many varieties of ferns and of gymnosperms are also known from the Jurassic rocks. The teeth and jaws of a few mammals—allied to marsupials and monotremes—have been found in the Oolite of

England They were carnivorous or insectivorous This was essentially the age of reptiles, and they attained a great size and a high degree of specialization

The most valuable mineral deposits found in Jurassic of America are the gold-quartz veins, known as the 'mother-lode,' of California In England the products obtained from these rocks include the fine freestones of Portland and Bath, and the Cleveland ironstone



*Relative sizes of the Earth (right) and Jupiter (left)*

**Jurieu, Pierre** (1637-1713), French Protestant theologian and controversialist, was born in Mer, in Loir-et-Cher His polemics with Arnauld, Fénelon, Bossuet, Bayle, and others, in defence of Protestantism, were able, but often aggressively fierce

**Jurisdiction** The extent or scope of the authority of a state, or, within a state, of its tribunals



*Telescopic view of Jupiter*

**National Jurisdiction** is limited (1) to the actual territory of the state, including the public waters thereof and the high seas to a distance of three miles from the shore, (2) to ships of war and the mercantile marine of the state wherever they may be on the high seas, (3) to ambassadors and other diplomatic agents while in the state to which they are accredited, (4) in some cases, by treaty with foreign powers, to its citizens or subjects while in the territory of such powers By international law

also a state may exercise a limited but somewhat indefinite jurisdiction in hostile territory provisionally occupied by its forces in time of war, and a jurisdiction still more indefinite in territories over which it exercises a limited authority as a protectorate or the like The federation of states in a central government, as in the United States, produces a division and sometimes a conflict of jurisdiction between the several states comprised in the federation and the central authority This division of jurisdiction and the limits to be assigned to that of the states and of the nation respectively are determined by the Constitution as interpreted by the courts The Federal Government of the United States is one of limited powers, the several States having reserved to themselves all jurisdiction not specifically or by necessary implication conferred upon the Federal Government by the Constitution

**The Jurisdiction of the Courts** may be co-extensive with that of the state or it may be limited to a portion of its area or to a particular class of subjects or of persons Sometimes the scope of the judicial authority is determined by the fundamental law, sometimes it is experimentally ascertained in the course of a court's development, but in the great majority of modern cases it is specifically defined by statute A court may have an *exclusive* jurisdiction, i.e., it may be the only tribunal in which a certain class of actions may be brought, or it may enjoy a *concurrent* jurisdiction, in whole or in part, with one or more other tribunals

The term jurisdiction is frequently employed by lawyers to describe the territory in which a certain court exercises jurisdiction, and more popularly to denote a domestic or foreign state

**Jurisprudence** The science of law The term is commonly employed by scientific legal writers to denote general or comparative jurisprudence, in which legal ideas common to all systems of law are analyzed, compared and classified It may, however, with equal propriety be applied to a particular legal system, as that of the Roman law or the common law of England and the United States

**Jury**, a body of men entrusted by law with the duty of determining disputed questions of fact In a legal system like that of England and the United States, in which the people at large participate to a considerable degree in the administration of justice, juries perform a variety of important functions

In its modern form the jury consists of a body of men, usually twelve in number, chosen from a large number of eligible persons (known

as the 'panel') by the concurrent action of the plaintiff or prosecutor and the defendant, and sworn to render a true verdict according to the evidence submitted to them. The entire jury sits throughout the trial of a cause, conducts its deliberations in secret, and at common law reaches its verdict by a unanimous vote. In a civil case the verdict, if for the plaintiff, awards the damages to which it finds him entitled and is usually expressed in the form, 'We, the jury, find for the plaintiff in the sum of — dollars', otherwise, 'We find for the defendant'. In a criminal case the verdict is, 'We find the prisoner guilty,' or 'not guilty,' as the case may be.

It remains to be added that the function of the jury in the administration of justice is a restricted one. In some courts and in many classes of cases juries are not employed, either because the questions involved are questions of law and not of fact, or because the court, not being a common-law tribunal, has developed a procedure in which the jury plays no part.

Jurors are usually selected from the citizens of the district over which the court in which they are sitting has jurisdiction. Ordinarily jurors are summoned to serve but in case of a lack of sufficient jurors the court may order officers to seize an eligible person anywhere and compel him or her to sit. In many jurisdictions members of both sexes sit on juries while in others only males may serve. In most jurisdictions certain persons are exempt from jury service, including army and navy officers and men, doctors, dentists, ministers, priests, lawyers, judges, and certain public officials.

The jury is usually the absolute judge of the facts as presented in evidence while the presiding judge is the authority on questions of law. In some cases, however, a judge may instruct a jury to find for one party or the other. Also, in some instances, judges may throw out the verdict of a jury if he finds that the finding was clearly against the weight of the evidence or that an award of damages was excessive. Appellate courts except in rare instances, would not upset a jury's verdict in a case where the evidence was conflicting. On points of law such courts often overrule decisions of lower court judges.

**Grand Jury**—A grand jury consists of 12 to 23 jurors who hear, in *ex parte* proceedings, evidence that a crime or crimes have been committed. By a majority vote the grand jury then either finds that the evidence is insufficient to warrant a trial on the merits

of the case and orders the release of an accused person or the grand jury may return an indictment under which an accused is brought to trial. Grand jury proceedings are almost always conducted secretly and jurors and witnesses are usually ordered, under threat of contempt or court proceedings, not to reveal information as to the evidence presented to the jury. In many jurisdictions grand jury indictments are necessary to bring a defendant before a trial jury but other places have abolished grand juries. Grand juries are often used to conduct inquiries into corruption in the public service, organized crime, illegal gambling, or the prevalence of vice.

**Coroner's Jury**—A jury which presides under the direction of a coroner over an examination into the facts pertaining to any death, the cause of which is not believed to be natural. The coroner presents evidence to the jury, through witnesses, and the jury then finds either that the death was caused by natural causes, by accident or inadvertence, or by particular or unknown person or persons. In many jurisdictions coroner's juries have been abolished and the investigation of suspicious deaths has been transferred to medical examiners acting without a jury.

**Jusserand, Jean Adrien Antoine Jules** (1855-1932), French diplomat and scholar, was born in Lyons. He was educated at the Universities of Lyons and Paris and entered the diplomatic service in 1876. He was Min-



*Jules Jusserand*

ister to Denmark from 1898 to 1902, when he was made Ambassador to the United States, a position which he held until 1925, having the distinction for many years of being the dean of the diplomatic corps in Washington. He was a grand cross of the

Legion of Honor, a fellow of the American Academy of Arts and Sciences, and corresponding fellow of the British Academy

**Jussieu, De**, a French family, chiefly of botanists. **ANTOINE** (1686-1758), born at Lyons, became professor of botany in Paris—**BERNARD** (1699-1777), brother of Antoine, also born at Lyons, possessed a rare knowledge of botany. He arranged the plants in the Trianon garden at Versailles under the system of classification afterward developed by his nephew, Antoine Laurent, in his *Genera Plantarum* (1789)—**JOSEPH** (1764-79), brother of the two foregoing, spent a great part of his life in South America, whence he sent the first seeds of *Heliotropium peruvianum* to Europe—**ANTOINE LAURENT** (1748-1836) is chiefly remembered for his *Genera Plantarum Secundum Ordines Naturales Disposita* (1789)—**ADRIEN LAURENT HENRI** (1797-1853) published a widely used *Cours Elementaire de la Botanique*—**LAURENT PIERRE** (1792-1866), French educational writer and moralist, nephew of Antoine Laurent. His most popular work was *Simon de Nanua* (1818), which ran through more than thirty editions, and was translated into nearly a dozen languages.

**Justice**, primarily one's due as a member of any social group, hence, as in the Roman law, the feeling of obligation to render it, then the abstract principle demanding it. What this due is, varies indefinitely. The enforcement of justice was, broadly speaking, the origin of law, whence it has currently come to mean the enforcement of law. Actually, however, much of it is beyond the reach of positive law, which can only punish and indemnify by rules laid down in advance—and therefore sure not to fit many individual cases.

In view of the insufficiency of the law, various supplementary agencies have been devised to cover more of the field, all being delegations by law, to certain bodies, of power to set aside or go beyond law at the call of justice. Thus, we have courts of equity to compel action, instead of merely requiting or undoing its results, humane societies, and commissions of various types.

**Justice of the Peace** is a local magistrate, with powers partly judicial, partly administrative, who is primarily concerned with the maintenance of good order in the district over which his authority extends. In the United States justices of the peace exercise extensive powers of investigating crimes and committing suspected persons to prison. They are also generally empowered to try small cases, civil and criminal. In some States they are created

by executive appointment, in others by popular election.

**Justice, U S Department of**, was created in 1870 to conduct the legal business of the Federal Government. It is administered by the Attorney-General, who has been a member of the Cabinet of the President since 1789. The Attorney-General is the public prosecutor and standing counsel of the United States, and the legal adviser of the President and of the heads of the other executive departments. Under the Attorney-General are the Solicitor-General, who has general charge of Government business in the Supreme Court, Assistant to the Attorney-General, charged with matters arising under the Federal Anti-Trust and Interstate Commerce laws, and six assistant attorneys-general.

Special activities of the Department of Justice are the enforcement of the land laws of the United States, the conduct of proceedings to regain public lands illegally acquired, jurisdiction over the receipts and expenditures of public money by U S marshals, clerks, and other officers of the Federal and Territorial courts, the approval of titles to lands or other property to be purchased by the Government, the defence of claims against the United States in the Court of Claims, the consideration of applications for appointments as U S attorneys, marshals, and judges, and the supervision and control of Federal prisons and prisoners.

**Justification** (1) In Law, justification may have either of two meanings. In *pleading*, it is the maintenance of the right of the defendant to perform the act charged by the plaintiff as a wrong. In *practice*, justification is the proceeding by which a surety establishes his qualifications for performing his undertakings.

(2) In Theology, justification is the act of God by which the soul is reconciled to Him. According to the Roman Catholic doctrine, defined by the Council of Trent, only such faith as is active in charity and good works justifies, and 'justification is not remission of sins merely, but also the sanctification and renewal of the inward man, through the voluntary reception of the gride and of the gifts whereby man from unjust becomes just.'

**Justinian, Flavius Anicius Justinianus** (483-565), emperor of Constantinople and Rome. In 521 he was named consul, and during the remaining years of the reign of his uncle, the Emperor Justinus, he continued to exercise great influence. In 527 Justin, by the advice of the senate, proclaimed him his part-

ner in the empire Justin survived this step but four months, and in the same year Justinian was proclaimed sole emperor, and crowned along with his wife, the famous Theodora.

It is as a legislator that Justinian has gained his most enduring renown. Immediately on his accession he set himself to collect and codify the principal imperial *constitutions* or statutes then in force. But Justinian's ambition went much further. Justinian resolved upon the publication of a single treatise in which the commentaries and other writings of the jurists might be digested and harmonized. This great work was completed in four years by Tribonian, with the assistance of Theophilus, a celebrated professor of law at Berytus. It was published in fifty books under the title *Digesta* or *Pandectæ* in 529. Justinian resolved on the composition of a third legal work—viz., a systematic and elementary treatise on the law which might serve as an introduction to the larger work. It was published by Tribonian and his colleagues on the same day as the *Digest*, under the title of *Institutæ ones*, and is familiar to modern lawyers under the name of 'Justinian's Institutes'.

Justinian II, surnamed *Rhinotmetus*, emperor of the East from 685 to 695 A.D., and again from 704 to 711.

Justin Martyr, one of the earliest apologists of the Christian Church, was born of Greek parents at Flavia Neapolis in Samaria, c. 100 A.D. The ability and zeal with which he defended Christianity and assailed paganism led at length to his martyrdom in Rome (c. 148 A.D.).

Justinus I, emperor of the East from 518 to 527 A.D. His reign is memorable chiefly for his resignation of the appointment of consuls to Theodoric, king of the Goths (522), for a war with the Persians, and for the destruction of Antioch in 525 by fire and inundations.

Justinus II, emperor of the East from 565 to 578 A.D., was a nephew of Justinian, whom he succeeded.

**Jute**, or **Calcutta Hemp**, a fiber obtained from several species of the genus *Corchorus* of the order Tiliaceæ, and employed in the manufacture of the coarser textiles. The fiber is separated from the stem by retting—i.e., steeping in water. Bundles of plants are immersed in tanks or stagnant pools, where they are allowed to remain until the inner bark begins to separate—a period lasting from ten to thirty-five days. The fiber is then stripped off, washed in running water, wrung by hand, and

dried, after which it is sorted and baled for market.

**Manufacture**—Jute cloth for gunny bags and for native clothing has long been woven by hand in India, its manufacture forming the great domestic industry of the populous eastern districts of Lower Bengal. The first Indian mill was erected in 1855. The introduction of the fiber into Europe dates from late in the eighteenth century, and its use on a commercial scale from about 1832, when the spinning and weaving of jute fabrics was begun at Dundee, Scotland, now the chief center of the industry.



Jute Plant (*Corchorus Capsularis*)

1, Flower, 2, Fruit

The bales of jute, which weigh about 400 pounds each, having been hard packed by hydraulic power to save cost of freight, are first put through the jute opener, in order to prepare the fiber for the softener or mangle, into which it is fed in small bunches or stricks. The jute as it passes through may receive a sprinkling of oil and water from automatic apparatus attached to the machine overhead,



or it may be arranged in layers and sprayed with oil after emerging from the softener, a process known as *batching*. In either case the material is then allowed to lie a certain time in bulk, to permit of the fiber being thoroughly permeated with the oil.

After this simple preparation the fibers, now about six feet long, are passed on to the breaker card, where they are reduced in length, finely divided, thoroughly mixed, cleared of impurities, and laid in parallel order. A doffer roller then strips the elongated lap from the main cylinder and sends it down a broad channel, which compresses it to a strand or sliver about four inches wide. Twelve of these slivers are then fed into the finisher card.

From the finisher card the jute is taken to the drawing frames. Four of the slivers from the finisher cards are put through the first drawing frame, and are discharged by it in one small sliver. Two of these slivers are then put through a second and finer drawing frame, and further combed and drawn out into one end. The cans of slivers are then taken to the roving frames, where the material is again drawn out, twisted, and wound on to the rove bobbins. The latter are taken to spinning frames of the throstle type, and spun into yarn of various sizes, with a hard twist for warps and a softer twist for wefts. The warp yarns on bobbins are then passed on to the spooling and dressing machines, or are reeled in hanks and bundles for the purpose of being bleached or dyed in various colors for stripes in the fabric to be woven. The weft yarns are taken to the cop winding machines.

The machinery for the spinning and weaving of jute has been so perfected that the fiber is now used either wholly or in part in a great variety of fabrics, as towels, sheetings, shirtings, rugs, carpets, and upholstery goods. Its chief application, however, is in the coarser textiles, as hessians, bagging, and tarpaulin.

Jute Bags or Gunny Bags are used to carry produce to all parts of the world—especially grain, sugar, coffee, and vegetables. In Lower Bengal, since 1850, the making of these bags has constituted the chief domestic industry, but in other parts of India their manufacture has been largely taken over by steam factories. The bags are also made in Scotland and the United States. In 1941 India cut the acreage planted to jute by half.

**Jutland** (Danish *Jylland*), the largest and only continental province of Denmark, extends north from Kolding Fiord and Ribe to the Skaw. The chief trading place on the Baltic

is Aarhus. Jutland in the 5th century was inhabited by the Jutes, who took part in the expedition of the Saxons to England. The Jutes were succeeded by the Danes, who, under the name of Normans, frequently desolated the coast of Germany and France.

**Jutland Bank, Battle of** (May 31-June 1, 1916). An adequate test of the strength and efficiency of the Grand Fleet of Great Britain and the High Seas Fleet of the German Empire had long been one of the anticipated events of the great War of Europe, because both fleets were known to be making periodical sweeps through the North Sea. In pursuance of this policy, Admiral Sir John Jellicoe, commander-in-chief of the British Grand Fleet, on May 30, 1916, instructed his ships to leave their bases on the following day. The better to insure an action in case of meeting, neither of the opposing navies cruised in close formation, and on this occasion the Grand Fleet was, as usual, tactically divided.

A division under Vice-Admiral Sir David Beatty scouted southward of the main battle fleet. At 2 20 P. M. on the afternoon of May 31, when Beatty's ships were off the northwest coast of Jutland, the *Galatea* reported the presence of enemy vessels to the north and east, and the Vice-Admiral, informing the Commander-in-Chief by wireless, headed in the direction of the foe. The German battle cruisers were finally sighted from the British decks at 3 31, headed s. s. e. At 3 48 the action commenced, at a range of 18,500 yards. It was but a short time before the first casualty of the fight—the loss of the British battle cruiser *Indefatigable*—occurred. The British destroyers continued the attack on the German battle cruisers, and before they were recalled two were sunk and two remained helpless afloat, and were sent to the bottom by the Germans after the survivors had been taken off. About 4 30 an explosion was seen to take place on the battle cruiser *Queen Mary*, and she immediately sank. The fighting between the opposing battle cruisers had now reached a state of great fierceness.

About 5 45 Beatty sent his light cruisers and destroyers in a rapid attack against the German battle cruisers. The latter, however, with great skill and agility managed to dodge the torpedoes, and their own light cruisers and destroyers were once more thrown against the enemy. But as they moved out on this errand, they received an unexpected fire from heavy guns in the northeast, and hastened back to the protection of their battle cruisers. This

fire came from an armored cruiser squadron in advance of Admiral Jellicoe's battle fleet.

On receipt of Beatty's wireless despatch, the British Commander in Chief made directly for the scene of action. The Third Battle Cruiser Squadron, under Rear-Admiral Hood, was ordered to reinforce Beatty, and forged ahead. This brought Hood at 6.20 within 8,000 yards of the head of the German fleet. Beatty signalled him to take position in rear of his (Beatty's) column, but before he could obey his flagship the *Invincible* was sunk.

The remainder of Jellicoe's squadrons came gradually into the fight after 6.00 P.M. As soon as he was able to locate the enemy battleships, the British Commander formed a line of battle, and even during deployment the fleets became engaged. The action between the main battle fleets lasted intermittently for two hours after a quarter past six at ranges between 9,000 and 12,000 yards, and with the great vessels visible only at periods through the mist. Both sides were constantly endeavoring to close in with advantage, and changed their course to a southerly direction, and so continued up to 9 P.M., when the British, having gotten around the German fleet, were then between it and its base.

By daylight on June 1, the British ships were southwest of the Horn Reefs, and the haze had increased. No German vessels were to be seen, and at 11.00 A.M. Admiral Jellicoe decided that the High Seas Fleet had

succeeded in getting home, and he returned to his own base.

The Battle of Jutland Bank, although the greatest clash of sea forces in the world's history, brought no decisive victory. The British lost three battle cruisers, three cruisers, and eight destroyers. The Germans reported the loss of one battleship, one battle cruiser, four cruisers, and five destroyers. The loss of life on some of the British vessels was very great, nearly the entire complement of the *Queen Mary* perished.

**Juvenal**, whose full name was **Decimus Junius Juvenalis**, Roman satirical poet, was born probably between 60 and 72 A.D., and lived until after 128 A.D. His extant works consist of sixteen satires, which were published in five books. The first nine satires are quite distinct in character from the last seven. The former are attacks, in the bitterest and most violent language, on the crime, vice, and folly of Rome; the latter are rather moral essays on various subjects. He appeals to modern readers by the similarity in many points of our present rich, affected, and luxurious civilization to that of his own day, and by the power of his epigrams, many of which are household words as quotations.

**Juxon, William** (1582-1663), archbishop of Canterbury, was born at Chichester. He attended Charles I. on the scaffold, and at the Restoration was appointed to the archbishopric of Canterbury.

# K

K

Kafiristan

**K** is the voiceless back stop, before utterance the breath is stopped by raising the back of the tongue. In recent years the employment of *k* has become general in the English spelling of foreign words ('Koran,' not 'Coran') Initial *k* before *n* has now become silent ('know,' etc.)

**Kaaba**, the sanctuary at Mecca, the centre formerly of pagan, now of Islamic worship. Tradition associates the Kaaba with Abraham's casting out Hagar and Ishmael. See **MECCA**.

**Kabardia**, fertile district on the north side of Caucasus, in Terek government, Russia. The Kabardintsi (32,000) are the only tribe of the Adighe (Circassians) which remains in the Caucasus.

**Kabba**, province of North Nigeria. Area, 7,800 sq. m., p. 200,000.

**Kabul**, city, capital of Afghanistan, 190 m. n. w. of Peshawar, 7,000 ft. above sea level, on the Kabul River. It has an arsenal and a mint, and trades in carpets, soap, shawls, silk and cotton goods. Kabul was in 1879 the scene of the murder of the British envoy, Sir Louis Cavagnari, and from here Lord Roberts set out, in August, 1880, on his memorable march to Kandahar.

**Kabyles**, a branch of the great Berber race of North Africa.

**Kadavu**, or **Kandavu**, one of the Fiji Islands.

**Kaf**, a mythical mountain range supposed by the Mohammedans to encircle the world, and to be the home of the giants, juns, and faeries.

**Kaffa**, or **Gomara**, trib. state of Abyssinia, in the Galla country. Exports coffee to Mocha. Some of the natives profess a corrupt Christianity. The chief town is Bonga.

**Kaffirs** are the predominant native people of S. Africa between the Zambezi R. and the Cape. The link uniting the various Kaffir nations is mainly one of language. They are a mixed people, in all cases of negroid type, but often showing a strong infusion of Arab or Galla blood, especially in the families of chiefs.

This intermixture is assigned to times long antecedent to their advent in the regions of the Zambezi.

During the long and arduous struggles between the colonists (often with the aid of British regulars) and the Kaffirs, the fiercest and most successful opposition came from the Zulu tribes, who, under the successive military autocracies of Tshaka, Pindar, and Cetshwayo, had been welded into a magnificent and almost invincible military organization. To-day the Kaffirs are all subject, directly or indirectly, to British rule. In Cape Colony, Natal, Orange River Colony, and the Transvaal they are more or less Europeanized, and work in the mines, in the construction of roads and railways, as farm laborers, and as domestic servants. On proving certain qualifications, Kaffirs in Cape Colony and Natal may receive certificates of citizenship and become voters. Each hut, throughout British S. Africa pays a yearly tax to government, varying from \$2.40 to \$5.00, and revenue duties are also laid on Kaffir beads, picks, hoes, blankets, shawls, and unmanufactured tobacco. Otherwise, the native organization, in these semi-independent territories, is intact. The king or chief is supreme, although guided to some extent by his prime minister and sub chiefs. Agriculture is the work of the women, who cultivate small plots of fertile soil. Their crops are sorghum (Kaffir corn), maize, pumpkins, melons, and 'sweet-reed'. Kaffirs are great owners of flocks and herds, cattle constituting their currency. Their arts include wood-carving, moulding pottery, and iron smelting. Their garments, often dispensed with, are skins or European blankets—a leopard's skin denoting a chief. Weapons: assegais, shields, and knobkerries (clubs). Religion: various forms of witchcraft, with, in some cases, a modified worship of the sacred ox (*inkala*). Under the peaceful conditions of recent years the Kaffirs have steadily increased in number.

**Kafiristan** is the territory on the S. slope of the Hindu-Kush, between Afghanistan and Kashmir. The country is of strategic import.

ance as an outpost of the Indian frontier, owing to its command of the passes of the Hindu-Kush

**Kagawa, Toyohiko** (1858- ), Japanese Christian social worker. Studied in Kobe Theological Seminary and Princeton. Worked for bettering conditions of poor in Japan. He wrote *Psychology of the Poor*.

**Kagoshima**, city, Japan, on the SI shore of Kiu-shiu Island, in the province of Satsuma, of which it is the capital. It was bombarded by the British on Aug 15 1861, and was the head of the Satsuma rebellion in 1877, p 184,900

**Kagu** (*Rhinocetus jubatus*), a curious bird found only in New Caledonia, and though generally resembling a heron, apparently most nearly allied to the crane.

**Kahn, Otto** (1867-1931), banker, was born in Mannheim, Germany. After learning banking in Germany and England he came to the U S in 1891. In 1907 he joined Kuhn, Loeb and Co.

**Kahoolawe**, one of the Hawaiian Islands.

**Kaibab Plateau**, a plateau in the northern part of Arizona, high reaches a height of 7,517 ft at Shinumo Camp.

**Karetur Fall**, a famous waterfall in the River Potaro, British Guiana, with a great fall of 741 ft.

**Kai feng-fu**, city, China, capital of the province of Ho nan, 10 m S of the Hoang-ho or Yellow River.

**Kain, John Joseph** (1841-1903), American Roman Catholic prelate, restored several churches damaged during the Civil War.

**Kaiser, Henry J** (1882- ), U S industrialist, was born in Canajoharie, N Y, left school when 11 years old and became a roving photographer, a land and gravel salesman, a paving contractor, and in World War II 'one of the great natural resources of a nation at war'. He supplied materials for Boulder Dam, combined with other contractors to build the great Western dams, constructed the Oakland-San Francisco Bay bridge, laid the highways of Cuba, built the world's largest cement plant, entered the magnesium, steel, airplane, and shipbuilding industries. He accomplished miracles in speeding up work, in 1942 constructed a Liberty ship in 5 days, sections were built separately, hoisted on cranes and joined by welding. He set up a medical insurance plan described in Paul de Kruif's book, *Kaiser Wakes the Doctors*, 1943.

**Kaiser**, the Teutonic equivalent for Caesar, used for the emperors of Germany.

**Kaiser Wilhelm Canal**, also known as the North Sea-Baltic Canal, and as the Kiel Canal, in Schleswig-Holstein, is 61 m long, and extends from near Brunsbittel on the Elbe to Holtentun on Kiel Bay. Two large locks in line run parallel to each other with a margin of 200 ft between them. The passage occupies from eight to ten hours, and the sailing is 700 m on the Kiel Canal passage. The canal was begun in June 1887, and opened in June 1895.

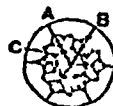
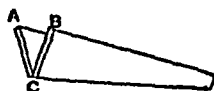
**Kaiser Wilhelm's Land**, the northern part of New Guinea, formerly a German protectorate administered since 1921 by Australia, under a mandate from the League of Nations.

**Kala-azar**, or Visceral Leishmaniasis, known also as dum dum fever, and tropical splenomegaly, a tropical disease characterized by a persistent fever of alternating, remittent or intermittent type rapidly leading to a cachectic condition with extreme emaciation and ultimate enlargement of the spleen and liver.

**Kalahandi**, or Karond, feudatory state, Central Provinces, India.

**Kalahari Desert**, a large barren or depressed area of the South African plateau, reaching from the Cape of Good Hope to the Zambesi probably 400 m from E to W, and 600 from N to S.

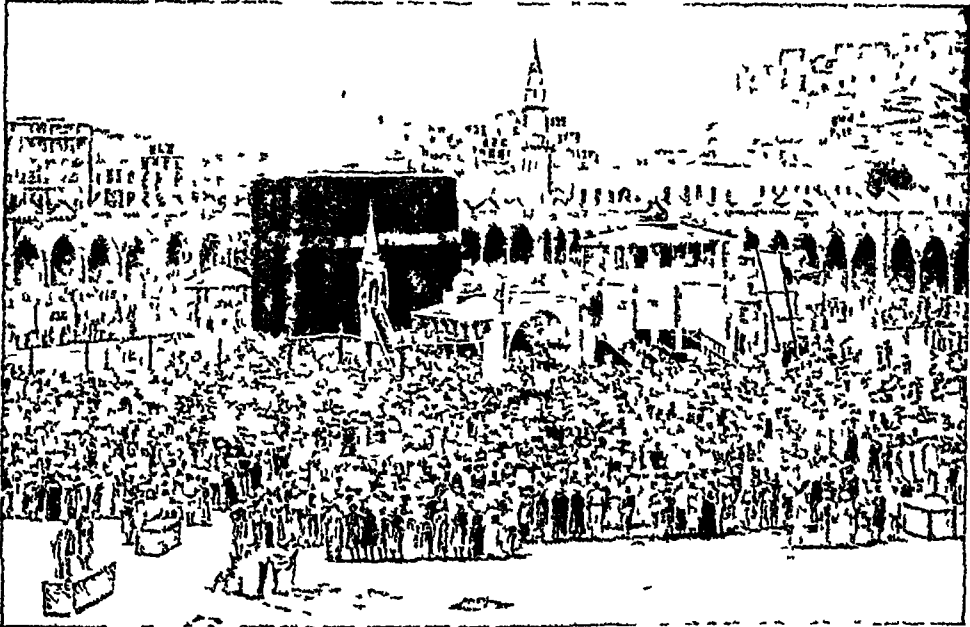
**Kalamata**, or Kalamai, seaport town, capital of the monarchy of Messenia, Greece.



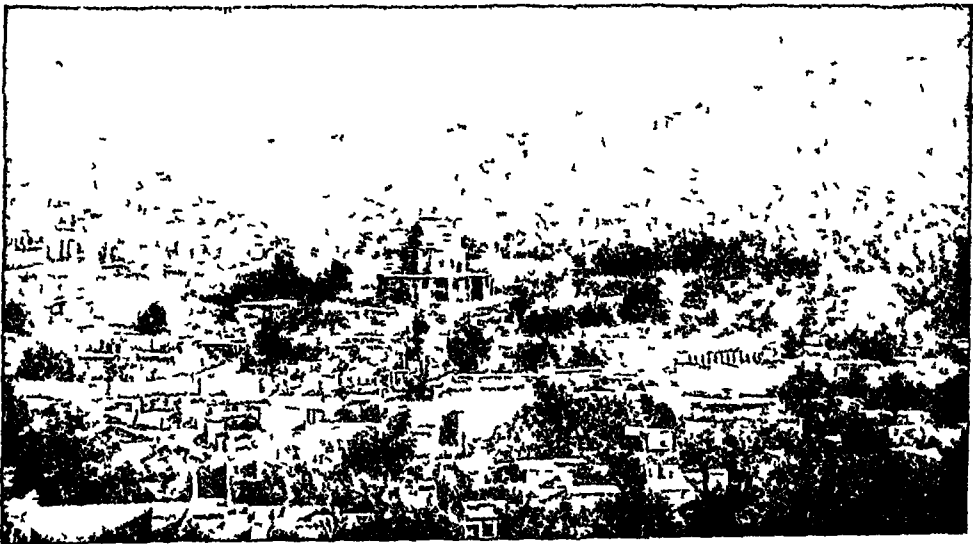
*Kaleidoscope*

External view, arrangement of mirrors AC and BC, and pattern as seen

**Kalamazoo**, city, Michigan, county seat of Kalamazoo co. Kalamazoo is situated in a good farming district, especially noted for its celery. Manufactures include paper, windmills, tanks, spring-tooth harrows, springs, carriages and wagons, cutters, corsets, mili-



*Pilgrims at the Kaaba, Mecca*



*Kabul*

tary regalia, machine-shop products, beet sugar, engines, and boilers, p 54,097

Kalamazoo River rises in Southern Michigan, and flows in a northwesterly direction for some 200 m to Lake Michigan, which it enters at Saugatuck, 29 m s of Grand Haven

Kalanao, Molokai, Hawaii Islands, a leper settlement, with churches public buildings, and a children's home

Kale, or Borecole, a cultivated variety of

*Brassica oleracea* which does not 'heart' after the manner of the common cabbage

Kaleidoscope, an optical instrument invented by Sir David Brewster about 1815, which became very popular as a toy. It consists essentially of a tube, within which are fixed longitudinally two mirrors at an angle—any even submultiple of  $360^\circ$ , in practice generally  $60^\circ$ —an eyepiece at one end, and an object-box containing fragments of colored

glass at the other. On striking the instrument, an infinite series of symmetrical patterns is presented.

**Kalevala**, the national epic of the Finns, written in the same metre as Longfellow's *Huacahua*, was collected and strung together out of scattered fragments by Lonnrot (1835, definitive ed. 1849). It relates the conflicts between the brothers Wainamoinen and Ilmarinen and their enemy Lemminkäinen. Magic, especially the magic 'mill' *sampo*, plays a great part in the story. There is an English translation by J. M. Crawford.

**Kalgan**, or *Chang-chia-ku*, walled frontier town of North China, in the province of Chi-li, 110 m n w of Peking. It is on the main route across Mongolia from Peking to Khabarovsk, in Siberia, and is an important centre of the tea trade; p. 70,000.

**Kalgoorlie**, town, Western Australia, in the East Coolgardie gold fields, 340 m n e of Perth, p. (1921) 7,898.

**Kali**. See **Alkali**.

**Kali**, Indian goddess of destruction, the wife of Siva. It was in her honor that the Thugs used to strangle their victims.

**Kālidāsa**, Indian poet, belongs to the post-Vedic period of Sanskrit literature. Tradition assigns him to the 1st century B.C., modern scholars to the 3d century A.D. His powers of imagination and description, and his grace of diction, place him among the greatest of Oriental poets, though to Western taste his work is marred by artificiality. He wrote three famous plays—*Shakuntala*, *Ikhamorasi*, and *Agamitra*, of which the first was translated by Sir William Jones (1789), and again by Monier Williams (new ed. 1890), also two epics, and lyrical pieces. One of these epics, the *Raghu-Vamca*, was translated into English verse by P. de Lacy Johnstone (1902). Consult Edgren's *Shakuntala, or the Recovered Ring*, and for bibliography, Macdonnell's *History of Sanskrit Literature*.

**Kalif**. See **Calif**.

**Kalimno**, or *Kalyminnos*, island off the s w coast of Asia Minor, 15 m n w of Cos. It is noted for its honey, and is the headquarters of the sponge industry of the Levant.

**Kalisch**, Isidor (1816-86), American rabbi, was born in Krotoschin, Posen, Prussia, the son of a learned rabbi. In 1848 he was compelled to leave Germany on account of his liberal views, and in 1849 went to the United States. In 1875 he settled permanently in Newark, N. J., and thereafter was occupied almost exclusively with his literary work and lectures. In behalf of reformed Judaism he

conducted a famous controversy with the Rev. Isaac Leeser.

**Kalispell**, city, Montana, county seat of Flathead co. Kalispell is the gateway to Glacier National Park and is the crossing point of five important highways, p. 8,245.

**Kalkas**, or *Khalkhas*, a nomadic people, inhabiting the steppes of Northernmost Mongolia. They number about 250,000.

**Kalmar**, city, capital of Kalmar Län, Sweden, on Kalmar Sound, 200 m s w of Stockholm. Here was drawn up (1307) the Act of Union between Sweden, Norway, and Denmark, conferring the three crowns on Margaret of Denmark.



*Kalmia latifolia*—the American Laurel

**Kalmia**, a genus of hardy evergreen American shrubs belonging to the order Ericaceae, valuable as ornamental plants. The most familiar species is *K. latifolia*, popularly known as Mountain Laurel, or Calico Bush, which sometimes grows to a height of thirty ft., with leaves dark green above and light green below.

**Kalmuks**, *Kalmucks*, or *Calmucks*, a section of the Mongol race, found in three main divisions. From the Volga Steppe took

place, in 1771, the famous migration of the Kalmuks (70,000 families) from Russian to Chinese territory, described by Pallis, De Quincey, and others. At present 160,000 Kalmuks are reckoned under Russian rule. In Chinese territory their number is estimated at from 250,000 to 850,000.

**Kalpasûtras**, a series of manuals of ceremonial in connection with the Vedic sacrifices. Together they form one division of the *Vedāngas*, treatises supplementing the *Vedas* and *Brahmanas*.

**Kalsomine**. See **Calcimine**.

**Kaluga**, government, of Central Russia. Area, 11,942 sq m. The surface is generally level and is traversed by the River Oka. Iron, coal, chalk, ochre, lime, limestone, potter's earth, and phosphorites are extracted, hemp and some cereals are raised. The chief industrial establishments are iron works, cotton, match, paper, and cloth factories, tanneries, distilleries and collieries, p est 1,497,200.

**Kaluga**, city, Russia, capital and chief town of the government of Kaluga, is situated on the River Oka. It has manufactures of leather, oil, bast mats, tallow candles, and 'Kaluga cakes', p 56,900.

**Kāma**, or **Kārnādeva**, the Hindu god of love. He is represented as riding on a sparrow, holding in his hand a bow of sugar-cane and five arrows, one for each of the five senses.

**Kama**, river, East Russia, the most important affluent of the Volga, having a length of 1,170 m and a basin of 202,600 sq m. It rises in Vyatka government, and flows n, n e, and s to its junction with the Byelaya, navigable from Ufa. It falls into the Volga forty m below Kazan.

**Kamakura**, town and seaside resort, Sagami province, Japan. It was anciently the military capital and one of the greatest cities of Japan, p about 10,000.

**Kamala**, or **Kameela**, a granular orange-powder, consisting of the small glands and hairs from the surface of the capsules of an Indian tree. Its value in medicine as an antelmintic depends on a resin, which constitutes four-fifths of its weight. It is a powerful gastro-intestinal irritant.

**Kamchatka**, peninsula in Eastern Siberia, extending in a southerly direction between the Sea of Okhotsk and Bering Sea, with an area of 104,500 sq m. It is traversed by a central range of mountains of an average elevation of 4,000 to 5,000 ft, e of which is a volcanic chain including active volcanoes. The Kamchatka River after a course of 325 m empties

into Bering Sea. The climate is generally severe.

The natural resources of Kamchatka include extensive forests, deposits of iron, copper, and coal, and a fauna rich in fur-bearing animals—fox, ermine, sable, seals—and in fish, which is a staple food. The population consists chiefly of Kamchadals—a Mongolian people—with a few Russians and Koryaks. They are engaged almost wholly in hunting and fishing. The capital is Petropavlovsk. Kamchatka was annexed to Russia at the end of the 17th century.

**Kame**, a low hill or ridge of glacial origin, consisting of stratified sands, gravels, and boulders deposited by streams issuing from under the ice. See **DRIFT**.

**Kamenets-Podolsk**, town s w Russia (Ukraine), capital of Podolia government. It has a Roman Catholic cathedral dating from 1361 and a 16th-century Greek cathedral. The town was annexed by Russia in 1795. Its large Jewish population suffered severely in the riots and massacres of 1905, p about 40,000.

**Kamerun**, or **Cameroon**, former German colony of West Africa. The total area of the colony was 191,130 sq m exclusive of New Kamerun (107,270 sq m) conceded by France to Germany in 1911. The coastline is about 200 m long. The coast lands are low, but the interior, as yet only partially explored, is reported to be a grassy plateau, rising rapidly from the coastal plain. North of the plateau region there are mountain masses and dense forests. Kamerun Mountain, or Monga-ma-Loba, on the coast, is an isolated volcanic mass rising some 13,700 ft. The climate is tropical, with an extremely heavy rainfall in the cool period from June to September. The coast lands are fertile, and coffee, cocoa, tobacco, rice, manioc, and yams are grown. Rubber, palm kernels, palm oil, ivory, cocoa, copal, copra, and kola nuts are exported. The natives of the coast regions are Bantus, those of the interior Sudanese. Kamerun was made a German protectorate in 1884. The seat of government has been at Buea since April, 1901, but the chief town is Duala (Kamerun). At the close of World War I, the colony was partitioned by France and Great Britain, the concession of 1911, together with additional territory almost half again as large, being placed under the Governor General of French Equatorial Africa, and the remainder (70,000 sq m) under the government of Nigeria.

**Kamimura**, **Hikonojo**, **Baron** (1850-1916), Japanese naval officer. After disting-

ushing his self in the war with China (1804-95), and the war with Russia (1803), he was made a baron in recognition of his services, was promoted to full admiral in 1810, and became supreme military councillor in 1811.

**Kaministiquia**, Canadian river, one of the largest tributaries of Lake Superior, enters by three arms into Thunder Bay at Fort William. About 25 m. from its mouth is the picturesque cataract Kaministiquia Falls.

**Kanakas**, general term for Polynesians, used by the whites of Australia and Polynesia. It usually designates coolies and contract laborers.

**Kanara**, a strip of country on the west shore of India, between the West Ghats and the Arabian Sea.

**Kanarese**, a Dravidian people of South India, some ten million in number inhabiting the plateau of Mysore, part of South Bombay, and the Kanara country. They possess an alphabet and a written literature with works dating back to the 12th century.

**Kanaris, Constantine** (1785-1877), Greek naval hero who figured in the war of independence, was born in the island of Ipsara (or Paros). He was minister of marine (1851-5, 1877), and for short periods in 1862, 1864, and 1865 was head of the government.

**Kanauj, or Kunnoo**, ancient city, Farukhabad district, United Provinces, India. Now in a ruined condition it is up to the 12th century A.D. a most important place.

**Kanazawa**, in Japan, is situated on the west coast of the mainland of Japan. It manufactures porcelain (kutan), fans, silks, and inlaid bronzes, p. 154,000.

**Kanchanjunga, or Kinchinjunga**, highest point of the Nepal Himalayas, North India, rises to more than 28,000 ft., S.E. of Mt. Everest. Many attempts have been made to climb to the top.

**Kandahar, or Candahar**, town, Afghanistan, capital of the province of Kandahar. It is a well-built city, strongly fortified and contains many mosques and bazars. The chief products are silk and felt. Fruit, corn, and tobacco are largely grown. Traditionally it was founded by Alexander the Great, p. about 20,000.

**Kandy**, former capital of Ceylon, India, lies near the centre of the island, on an artificial lake, 75 m. N.E. of the present capital, Colombo. Among features of interest are many temples, the finest of which is the temple of the sacred tooth of Buddha, which attracts crowds of pilgrims. Much has been done in recent times to restore and preserve the unique

Kandy decorations. Three miles distant are the famous botanic gardens of Peradeniya, among the finest in the world, p. 32,562.

**Kane, Elisha Kent** (1820-57), American explorer, remembered chiefly for his Arctic expeditions and his writings concerning them. In the first Grinnell expedition (1850-1), he was surgeon of the flag ship, the *Ida*, and he commanded the second expedition (1853-5), which is of great importance in the history of Arctic exploration. It is said that no single Arctic expedition of his generation added so greatly to the knowledge of the world as did that of Kane's. He published *The United States Grinnell Expedition* (1854) and *The Second Grinnell Expedition* (1856).



Kangaroo

**Kangaroo**, a marsupial found only in Australia, and nearby islands, specially modified for progression by leaping. The great flyingaroo, or 'boomer,' or 'old man,' attains a height of about five feet when standing upright. The fore limbs are very short, the hind ones long, with powerful elongated feet. The head is small, with pointed muzzle and large ears. The incisors are powerful, with a cutting edge. The fur is soft and woolly, and lighter in tint below than above. In the female there is a large pouch, in which the young are placed at birth, and become attached to the nipples by their immature mouths. At this time they are minute—not more than an inch in length—and, being too immature to suck, have milk pumped into them by the mother. They re-



main within the pouch until able to run by the side of the parent. Not until some eight or nine months after birth are they left to shift entirely for themselves. Usually only one or two young ones are produced at a birth. The giant kangaroo is an inhabitant of open plains, and occurs throughout most of Australia and Tasmania. The flesh was formerly an important article of diet among the natives. In feeding, the kangaroos often go down on all fours, but the habitual method of progression is by enormous leaps. They are social animals—

feet, and bears oval yellow fruits that are edible, and not unpleasant when ripe, but acrid when immature. Either raw or cooked it is an important food.

**Kangaroo Grass**, a tall, leafy grass, common in Eastern tropical regions. It is characterized by having long, bent awns. It is valued as fodder for stock.

**Kangaroo Hound**, an Australian dog evolved from the greyhound, crossed with the collie, with perhaps a strain of the aboriginal wild dog, or 'dingo'. It stands about twenty-



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*Kanchanjanga, the Second Highest Peak in the World*

timid and inoffensive save when brought to bay. In addition to the giant kangaroo, there are several allied species which inhabit rocky districts, such as the red kangaroo of Southern and Eastern Australia.

The name *wallaby* or brush kangaroo, is given to a group of small and highly colored species which occur in the dense scrub found in certain parts of Australia. To the kangaroo family also belong a number of smaller and much modified forms, such as the tree kangaroos of New Guinea and Queensland, the rat kangaroos and others. In 1907 a kangaroo farm was established at Bath, England.

**Kangaroo Apple**, an Australian shrubby plant which grows to a height of about six

eight inches high, is shaped like a thick greyhound, but carries a bushy tail. It is used for hunting the kangaroo and as a cattle dog.

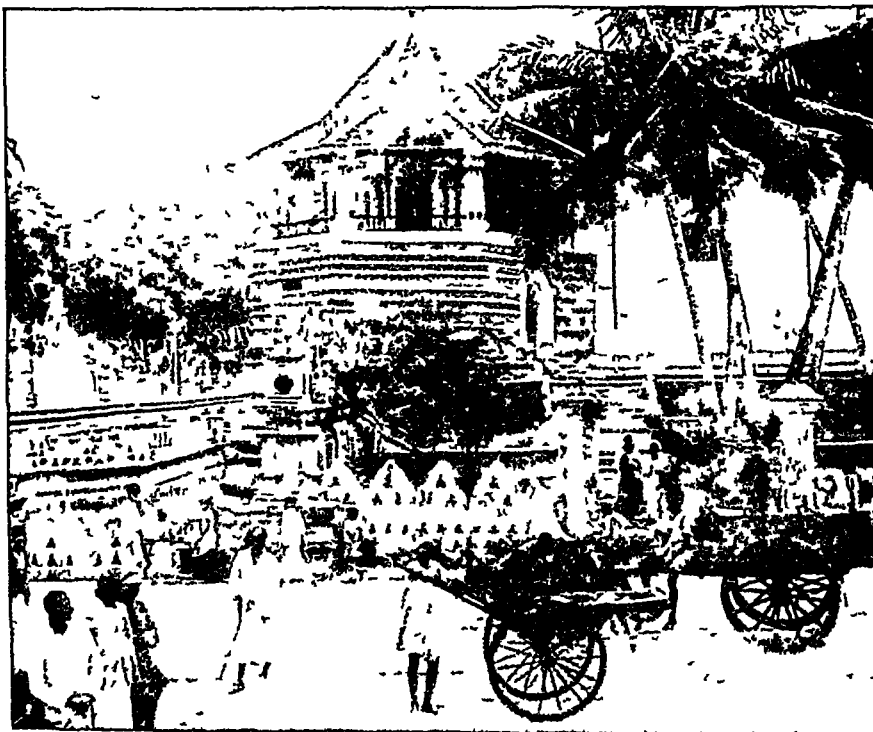
**Kangaroo Island**, South Australia, at the Gulf of St. Vincent, separated from Yorke's Peninsula by Investigator Strait, 8 m. from the mainland. Its greatest length is 85 m., greatest breadth, 30 m., area, 1,680 sq. m.

**Kangaroo-rat**, a small, handsomely marked, long-tailed, nocturnal rodent of the Southwestern United States and adjacent parts of Mexico. It dwells in colonies in underground galleries, feeds upon seeds, hibernates in winter and derives its name from the enormous development of the hind limbs. The rat kangaroo is sometimes called kangaroo-rat.

**Kanghoa** (K'ang-wa, Kang-Wha), 181 and its capital, in the estuary of the River Han, Korea, 45 m from Seoul. It was formerly strongly fortified, guarding the approach to the capital, and serving as a place of refuge for the court in times of danger. The forts were seized by the French, 1866, the Americans, 1871, and the Japanese, 1875. The city was the repository of many ancient documents which were destroyed by the French.

cloth being the chief industry. The making of all sorts of leather goods is also an important industry, and Kano is the source of most of the *morocco leather* sold in Europe. In the live-stock market are sold camels, horses, goats, oxen and asses. Silver, brass, swords and pottery are also manufactured, p 60,500.

**Kansas**, popularly known as the 'Sunflower State,' a North Central State of the United States, in almost the exact geographical center



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*The Temple of the Sacred Tooth in Kandy*

**Kangra**, or Nagarkot, town, Kangra district, Punjab, India. It is an important trading centre. The famous temple of Devi Bajreshi, one of the oldest in India, and the town itself were destroyed by the earthquake of 1905, p 4,500.

**Kano**, city, capital of Kano province, Northern Nigeria. Its walls are 11 m in perimeter. The city has long been the commercial centre of Central Africa through caravan trade with Tripoli and Mediterranean ports by way of the Sahara, a three months' journey. Kano is the principal manufacturing city of the region, weaving and embroidery of cotton

of the U S, is bounded on the n by Nebraska, on the e by Missouri, on the s by Oklahoma, and on the w by Colorado. The total area is 82,158 sq m, of which 384 are water surface.

Kansas belongs to the group of prairie States. Almost the entire surface is an undulating plain. The highest land is in the extreme west, altitude almost 4,000 ft. In the eastern part, in the river bottoms, it falls to about 750 ft. The climate is salubrious. The average annual temperature of the State is 54° F. A temperature of 100° is often recorded in summer, and 10° below zero in winter. The annual precipitation is about 30 inches in the central

part, about 40 inches in the eastern part, and about 16 inches in the extreme western part. Tornadoes sometimes occur. The soil is well adapted to agriculture, consisting mainly of a rich loam, and having a high percentage of mineral constituents. In the west, however, irrigation is necessary for agriculture.

The coal measures of Eastern Kansas underlie an area of about 15,000 sq mi, and have an estimated total thickness of 3,000 ft. They are classified as belonging to the Pennsylvania series of the Carboniferous. Western Kansas is characterized by formations consisting chiefly of Pliocene sandstones, and containing many fossils of mammals. East of this section, and occupying the north-central part of the State, are Cretaceous formations, yielding large quantities of chalk. The production of petroleum is the leading mineral industry of the State, with an output in 1939 of 60,723,000 barrels. Zinc is important, and natural gas, another mineral industry of value in the State. The largest producer of lump pumice in the United States is at Fowler, Kansas. Other products of the mines are lead, crude gypsum, clay, limestone and sandstone, sand and gravel, mineral water, mineral paints, lime, and asphalt.

Kansas is one of the foremost agricultural States. In the east, corn is the chief product. The middle third is the wheat belt, while the western third is best suited to grazing, though the wheat area is gradually extending westward. Kansas annually produces more wheat than any other state in the United States, held high rank in acreage of corn, exceeded most States in acreage and production of alfalfa and among the leaders in the growing of grain sorghums.

Kansas is one of the greatest cattle producing States in the U S, and Kansas City is the second largest live-stock market in the world. Orchard fruits are also a leading source of income.

The manufactures of Kansas have been largely the outgrowth of its extensive agricultural products, and they have been further stimulated by the development of rich zinc and coal mines and by the discovery of oil and gas. Leading industries are as follows: Slaughtering and meat packing, flour and other grain-mill products, petroleum refining, butter, cheese and condensed milk, railroad shop construction and repairs, foundry and machine shop products, printing and publishing, bread and other bakery products, cement.

The railway facilities are exceptionally good. The State is so situated geographically that it is traversed by several important railways,

connecting the industrial centres of the Mississippi Valley with points in the West and South-west. The Missouri River, on the north-east boundary, is the only navigable river. The population of Kansas according to the U S 1940 Census was 1,801,028, of which total 69,716 were foreign-born whites, 66,344 Negroes, 2,454 Indians, and 19,150 Mexicans. The urban population, in cities of 2,500 and over, represented 41.9 per cent of the total. The population of the chief cities in 1940 was: Kansas City, 121,458, Wichita, 114,966, Topeka, 67,833, Hutchinson, 30,013, Salina, 21,073, Pittsburg, 17,571, Leavenworth, 19,220.

The superintendent of Public Instruction is chief executive of the public school system. There is also a State Board of Education, consisting of the State Superintendent, the Chancellor of the State university, the President of the State Agricultural College, the Presidents of the State normal schools, and three others appointed by the governor. Attendance of children between the ages of eight and sixteen is compulsory. In 1930 there was only 1.2 per cent illiteracy. The State controls, through the Board of Administration, a School for the Blind, a School for the Deaf, the Industrial School for Boys, the Kansas State Industrial Reformatory, normal schools at Emporia, Pittsburg, and Hays. Other important institutions of higher learning include Baker University, the Municipal University, Washburn College, College of Emporia, Kansas Wesleyan University, Ottawa University, Southwestern College, St Mary's College, Bethany College, Friends University, Kansas City University, McPherson College, Sterling College. The Board of Administration has charge and supervision of the various State institutions.

The present constitution of Kansas went into effect in 1861, and has since been frequently amended. Under the Reapportionment Act Kansas has 6 Representatives in the National Congress. Topeka is the State capital. The State takes its name from the Kansas Indians. Coronado, a Spanish explorer, passed within the limits of the present State in 1541, in 1719 it was visited by a French expedition, and in 1804 the Lewis and Clark expedition traversed the region. Subsequent explorations were made in 1806 and 1819, and in 1827 a military post was established at Fort Leavenworth.

With the exception of the extreme southwestern section, Kansas was originally included in the territory of Louisiana, which was acquired by the United States from the French

in 1803. In 1812 Congress passed an act substituting the name Missouri for that of Louisiana. The southwestern section was a part of Mexico until Texas won its independence, when it passed under Texas control, and was acquired by the United States in 1850.

On May 30, 1854, Kansas was set off from Missouri and organized as a Territory under the provisions of the Kansas-Nebraska Bill. A bitter and protracted struggle between the friends and foes of slavery followed. Many immigrants from both the slave and the free States poured into the Territory. In 1857 Governor Walker effected a compromise, by the terms of which the free State party agreed to join in the election of a legislature. At this election the pro slavery party was defeated, but a previously elected pro-slavery convention, in session at Leecompton, proceeded to draw up a State constitution, guaranteeing the right of slave holders to their slaves, prohibiting the passage of any emancipation act, and also prohibiting any amendment before 1864. Only part of the constitution was submitted to the electorate, however—in such a way as to preclude the abolition of slavery, even though a majority vote should be cast against it. The free State men declined to vote, and the legislature ordered an election in which the whole constitution could be voted on. In the election of January, 1858, the Leecompton constitution was overwhelmingly defeated, and the free-State men secured the reins of government. A constitution, known as the Wyandotte constitution, prohibiting slavery, was adopted by a large majority. On Jan. 29, 1861, Kansas was admitted to Statehood. After the Civil War the State attracted a large immigration, and developed rapidly. Consult *Kansas Historical Collections* issued by the State Historical Society, Connelley's *History of Kansas* (5 vols. 1928), Blanchard's *Conquest of Southwest Kansas* (1931), W.P.A. Writers' Project, *Kansas* (1939).

**Kansas City**, city, second largest in Missouri, on the right bank of the Missouri River, opposite Kansas City, Kansas. Eighteen railroads enter the city, which is near the geographical center of the U. S. The Union Passenger Station with its approaches represents an investment of \$50,000,000. It is the third in size in the world and the largest in the United States outside of New York City. The city is built on three levels—the highest being the residence section, the middle level, the retail district, and the low-lying sections being devoted to wholesale trade and manufacture.

Situated at the gateway to the rich agricul-

tural regions of the West and Southwest, Kansas City is considered the market of this vast territory. Fuel oil, coal, and natural gas occur in the nearby regions. It has the third largest terminal market in the United States, and ranks third in the aggregate volume of grain storage capacity and third as a flour-milling centre. The Kansas City Board of Trade, a voluntary association of dealers in grain and grain products, furnishes a hall for trading, establishes rules of conduct, adjusts business disputes, and compiles statistical data. There are approximately 100 elementary schools, twelve high schools, a junior college, a teachers' college and two trade schools in the city's public school system, six private schools, more than a score parochial schools and a half-dozen professional schools.

The Nelson Gallery of Art, endowed with \$15,000,000 is world famous. Listed among the leading products are bread and other bakery products, flour, feed and other grain-mill products, printing and publishing, butter, cheese, condensed and evaporated milk, steam railroad construction and repairs, awnings, tents and canvas covers, food, foundry and machine-shop products, men's clothing, confectionery, and women's clothing.

Kansas City is the Reserve City for Federal Reserve Banking District No. 10. The population of the city (1940) was 399,178. Settlement was first made in 1808.

**Kansas City**, city, Kansas, the county seat of Wyandotte co., situated at the junction of the Missouri and Kansas Rivers, opposite Kansas City, Missouri. The site is similar to that of the latter city, being partly on elevated and partly on low ground. A viaduct connects the heights of the two cities. Among numerous parks and playgrounds is City Park, which has great natural beauty. Privately controlled institutions include Kansas City University, and the Kansas City Baptist Theological Seminary. The city has a handsome Federal building, Public Library, State Institution for the Blind, and well-equipped free hospitals.

Industrially and agriculturally Kansas City, Kansas, is the metropolis of the Kansas-Missouri valley. It is the largest city and leading manufacturing city of the State. Next to Chicago it has the largest meat packing industry in the United States. Next to meat packing, soap manufacture is important, the city ranking third in this industry. Other important industries are flour and other grain mill products, car construction and repairs, foundry and machine shop products, butter, bread and other bakery products, druggists' prepara-

tions, oil refining, ice manufacture and book and job printing and publishing, p 121,158

**Kansas-Nebraska Bill**, a bill for the organization of the Territories of Kansas and Nebraska (with limits much larger than those of the present States) passed by Congress in 1854. It embodied the principle of 'squatter' or popular sovereignty, and repealed the Missouri Compromise of 1820 its most significant clause being that it is 'the true intent and meaning of this act not to legislate slavery into any Territory or State, nor to exclude it therefrom, but to leave the people thereof perfectly free to form and regulate their domestic institutions in their own way, subject only to the Constitution of the United States.' The Kansas Nebraska Bill reopened, in all its rancor, the slavery controversy which had been temporarily checked by the Missouri Compromise, and may fairly be said to have hastened the outbreak of hostilities between the North and the South.

**Kansas River**, formed by the junction of the Smoky Hill and Republican Rivers, in Kans, joins the Missouri River at Kansas City, Kans. Its length is nearly 300 m or, with the Smoky Hill, nearly 600 m.

**Kansas State Agricultural College**, a co-educational institution in Manhattan, Kansas, established in 1863 under the terms of the Morrill Land Grant Act. The college owns 1,398 acres of land near Manhattan, of which 160 acres constitute the campus, the remainder being devoted to educational and experimental work in agriculture. The college confers the degree of B S, the degree of B M, and the degree of D V M.

**Kansas, University of**, a co-educational institution of higher learning opened at Lawrence, Kansas, in 1866. The University includes a graduate school, College of Liberal Arts and Sciences, Schools of Engineering, Fine Arts, Law, Pharmacy, Medicine, and Education, Summer School, Extension Division, Reserve Officers Training Corps, Divisions of Athletics, of Libraries, of Museums, of Publications, of State Service Work, of School of Business.

**Kansas Wesleyan University**, a co-educational institution of learning in Salina, Kans, founded in 1886 under the auspices of the Methodist Episcopal Church. Academic, collegiate, normal, musical, commercial, and oratorical departments are maintained, and the degrees of A B and B S are granted.

**Kan-su**, province in Northwestern China, bounded on the north by Mongolia, on the east by Shensi, on the south by Shensi and

Szechuen, and on the west by Tibet and Chinese Turkestan. Opium, wheat, millet, beans, tobacco, sheep's and camels' wool, grapes, and rhubarb are among the chief products. Coal is common, but is not worked systematically, and copper and gold are found. Communication is very defective. Area, 125,183 sq m, p 7,122,818.

**Kant, Immanuel** (1724-1804), one of the greatest of philosophers—whose system indeed, is the central fact in modern philosophy—was born in Königsberg. Never strong he regulated his life by a rigid and careful system. Precise times of rising, working, walking, and dining were scrupulously observed, and he disliked very much to have the routine of his day disturbed in the slightest degree. The only notable event of his later life was the conflict into which he was brought with the Prussian censorship by his published religious views, as a result of which he temporarily submitted to be silenced.

It is usual to distinguish three periods in the development of Kant's thought: 1 the early period, in which he received and acquiesced in the current Leibniz-Wolffian type of philosophy, 2 a period of reaction, during the 'sixties, against this philosophy in which he was influenced partly by the English empirical philosophy and ethics, and 3 finally, the period in which he developed his own critical philosophy, and which may be said to begin with his inaugural dissertation as professor of philosophy in 1770, though it was not till eleven years after that he published his chief work, *The Critique of Pure Reason*, and his position in the meantime had undergone an important change.

The distinguishing feature of the critical philosophy is that it undertakes to investigate the faculty of reason or knowledge first of all, and to determine its limits before entering upon the work of systematic construction. Kant accordingly rejects the old rational psychology, rational cosmology, and rational theology, all of which professed to attain a knowledge of super-phenomenal realities. Phenomena, since they do not exist in themselves, but only in relation to mind, must conform to the laws of the mind's structure. It was one of Kant's main philosophical interests to explain and defend the high scientific claims of mathematical and physical knowledge against the questionings to which these were subjected by an empirical philosophy.

But the vindication of science was not the only fruit of reason's self-denial. A no less valuable benefit was the vindication of morality, and that religious faith which rests upon it.

If Kant rejected the high but empty pretensions of the old rational theology, he seemed to himself to gain thereby that more real and accessible faith which springs from man's moral consciousness. If we do not and cannot know God as First Cause and Architect of the universe, we can and must believe in Him as the moral Governor who will make the moral law finally prevail. But this religious faith depends upon the absolute validity of the moral law, and Kant sought no less strenuously to establish in his ethical works, *Groundwork of the Metaphysics of Ethics*, and *Critique of Practical Reason*, the claims of a high and austere morality than he had formerly asserted the claims of science in his *Critique of Pure Reason*.

At one time inclined to see the basis of morality in a moral sense or feeling, Kant later became convinced that the very slightest appeal to feeling was a danger to morality, and that the purity of ethics could be guaranteed only when reason alone gave the law. The only thing good without qualification is the good will—the will that gives itself in free submission to the moral law, and the moral law, which is reason's own law self imposed, has but the one supreme commandment—to eliminate from our action every subjective or selfish motive, to follow no rule of action which we cannot will to be universally obeyed. Only a being who is free, able to rise above the pressure of motive and desire, can so will and act. Consequently we must postulate freedom of the will for man on the ground of his moral consciousness. 'I ought, therefore I can.' In the later *Critique of Judgment* Kant goes some way toward reconciling the dualism of the two other critiques, but the fuller development of his suggestions was left for his idealistic successors.

The chief works of Kant have been translated into English. The fullest English account of his philosophy is Caird's *Critical Philosophy*. Consult also Chamberlain's *Immanuel Kant* (1905), Webb's *Kant's Philosophy of Religion* (1926), Thuborg's *Immanuel Kant* (1930).

**Kaolin**, or **China Clay**, is a hydrated aluminum silicate, and in its commercial form is a fine, almost impalpable powder of pure white or faintly yellow color, very soft, and slightly greasy to the touch. It softens, but is still infusible at 1880°c. It absorbs moisture readily, and when wet is plastic, so that it can be moulded in the solid.

Kaolin is rarely found sufficiently pure for commercial use without washing to clear it of particles. It is used in the manufacture of porcelain and pottery (along with feldspar,

flint, etc.) and in the preparation of sizes for smooth faced printing paper, employed for illustrated books with process engravings. It is also used for sizing and loading cheap cotton goods. Much alum is prepared from kaolin by the action of strong sulphuric acid. It is also used in making ultramarine pigment. In the United States, the Southern States are the chief source of supply of domestic kaolin, reporting 81 per cent of the total in 1930. Georgia is the largest producer, reporting 52 per cent of the total in 1930.

**Kapila**, founder of the Sāṅkhya system of Hindu philosophy, and reputed author of the *Sāṅkhyasūtras*. When he lived is quite uncertain.

**Kapok**, or 'silk-cotton,' a material used for stuffing seats and pillows, obtained from the kapok tree, a tall evergreen of the East and West Indies and other tropical regions. It belongs to the bombax family.

**Kapurthala**, town, capital of the state of Kapurthala, Punjab, India, in the center of an agricultural section. It contains the Raja's palace, Randhir College, a girls' school, a high school, and a hospital, p. 16,242.

**Kara**, sea, Russia, a branch of the Arctic Ocean, 170 by 300 m. It is open for navigation from six to eight weeks every year during July to September.

**Karachi**, or **Kurrachee**, municipal town, Bombay Presidency, India. The sea breezes render the climate superior to that of the remainder of the province. The rainfall is slight, averaging only 5 inches annually. Hindu and Mohammedan merchants congregate in the oldest part of the town, along Bandar Road. The shipping quarter is on the former island of Krimari. Karachi is the fourth greatest British Indian port and the greatest wheat port of the British Empire. The completion in 1912 of the Upper Chenab section of the Punjab Triple project, irrigating 2,000,000 acres, greatly increased the grain trade of the port. The chief exports are wheat, cotton, rapeseed, wool, hides and skins, and gingelly, imports, piece goods, sugar, metals, kerosene, timber, coal and coke. Among notable buildings are the clock tower monument to Sir William Merewether, the Sindh and Mohammedan Colleges, several schools and hospitals, Frere Hall, an auditorium and public library, in front of which stands the statue of Queen Victoria presented by King George in 1906.

Industrial establishments include the government arsenal and printing press, and manufactures of tin, cotton textiles, flour, etc. Fish-

ing is also an important industry, p 260,639

**Kara-George**, or **Kara-jorj**, the name given to a Serbian patriot, Czerny George. From him is descended the ruling dynasty of Yugoslavia. **PETER I** was recalled from exile to succeed King Alexander Obrenovitch of Serbia in 1903, after the murder of the latter and his queen Draga Mashin. Peter died in 1921 and was succeeded by his second son, Alexander I, King of Yugoslavia, born 1888, married, 1922, to Princess Marie of Rumania, daughter of King Ferdinand and Queen Marie of Rumania. He was assassinated in France in 1934 and was succeeded by his young son, Peter II.

**Karaites**, a Jewish sect who adhere to the strict letter of Scripture, and reject oral tradition and depreciate the Talmud. The schism arose at Bagdad about the middle of the 8th century A D, under the leadership of Anan ben David. The adherents are most numerous in South Russia, especially the Crimea.

**Karakoram** **tsung-ling**, or **Mustagh Mountains**, a range of Central Asia, between East (Chinese) Turkestan on the north and India on the south. It connects the northwest angle of the Tibetan plateau with the southeastern corner of the Pamir, and divides the basin of the Tarim from that of the Indus. It is separated from the Himalayas by a long depression, nearly 450 m long, and the pass of Karakorum is the principal commercial route connecting India and East Turkestan. It is traversable throughout the year, though it is 18,500 ft above the sea-level.

**Karakorum**, properly **Kara-Kuren**, the ancient capital of the Uigur empire, and of the Mongol empire in the middle of the 13th century. It forms a vast heap of ruins in the valley of the Orkhon in North Mongolia.

**Karakul**. See **Persian Lamb**.

**Karamania**, or **Caramania**, the central plateau of Asia Minor. It has a barren soil and a hot, dry climate and is sparsely settled by cattle-raising nomads.

**Karamzin**, **Nicolaï Mikhailovitch** (1766-1826), Russian historian. He made his reputation as a stylist with *Travels from Moscow*, and in the same year he was appointed imperial historiographer and at once began his great *History of Russia* (11 vols., 1816-29, 6th ed 1850-3), which he continued till his death, bringing it down to 1613. It is the first systematic history of Russia, and Karamzin was one of the creators of modern Russian prose. His other works include the novels *Poor Liza* (1792), *Natalya, the Boyer's Daughter* (1792), *Martha the Viceregent* (1793).

**Karategin**, district, Bokhara, Russian Central Asia, lying s of Fergana. It includes an area of about 4,000 sq m. Shut in by lofty mountains, it has a severe climate, but nevertheless produces cereals, mulberries, apricots, peaches, cherries, apples, and walnuts, p about 100,000, chiefly Aryan Tajiks, but including also 15,000 Kirghiz.

**Karauli**, or **Kerowlee**, feudatory state, India, in Rajputana, with an area of 1,242 sq m. The country is hilly and rich in timber. The people are mostly employed in agriculture and cattle-breeding. Sheepskin and furs are exported. The capital, Karauli, is surrounded by a sandstone wall, p 133,730, city, 19,579.

**Karawala**, a small viper of Southern India and Ceylon, closely related to the American copperhead, and of similar appearance, about 18 inches in length.

**Karelia**, former district of Russia lying between Finland and the White Sea. In 1923 it became an autonomous republic of the Union of Socialist Soviet Republics.

**Karenni**, plateau (3,000-4,000 ft) between Lower Burma and Siam. The district is well cultivated and fertile and is inhabited by the tribe of Red Karens.

**Karens**, a tribe of semi-aborigines on the eastern frontier of Burma and the western border of Siam, and in the Irawadi delta. Their prehistoric home seems to have been in Southwest China. Some of them have settled in the Plains, and have adopted Buddhism, others are nomadic tribes, and retain their primitive nature-worship, while a large number have become Christianized.

**Karli**, a renowned Chaitya cave temple, 25 m s e of Bombay, India. It is cut in a rocky wall 850 ft high, and the interior, 126 ft long, 45 1-2 ft broad, and 46 ft high, is adorned with richly carved columns and has a shrine at one end.

**Karlsbad**, or **Carlsbad**, or **Karlovy Vary**, town and famous health resort, Czechoslovakia, in Bohemia. The little town is squeezed into the narrow and romantic valley of the Tepl, and is surrounded by pine-clad mountains. The waters are warm (80°-136° F) and alkaline-saline in quality, and are said to be beneficial in cases of rheumatism, dyspepsia and gout. The season is at its height in June and July. Porcelain, goldsmiths' work, liqueur, needles, and ornaments (made of the petrefactions of the mineral water) are produced. Salt from the springs and the mineral water itself are largely exported. The waters were first used for bathing about 1520, and now the town is visited annually by about 75,000 people.

**Karlskrona**, or **Carlskrona**, fortified seaport, Sweden, on an island off the southern coast. Since 1680 it has been the chief station of the Swedish fleet and has ship-building yards, an arsenal, naval school, and hospital. Other industries include tobacco, hat, cloth, and match factories, p 27,188

**Karlsruhe**, or **Carlsruhe**, town, Germany, capital of Baden, near the northern end of the Black Forest, 6 m e of the Rhine, on which it has its port of Mrtau, and 34 m s w of Heidelberg. Among features of interest are the Academy of Art founded in 1853, which, with a picture gallery and the exhibition of the Karlsruhe Art Association, have given the place some importance in the art history of Germany, the palace of the hereditary grand duke, and monuments. Of recent years Karlsruhe has become an industrial centre, producing manufactured goods, p 145,694

**Karlstad**, or **Carlstad**, town, Sweden, on the island of Thingvalla at the northern end of Lake Wener. Two large bridges join the island with the mainland. It has manufactures of machinery, tobacco, and matches. Here was signed, Sept 23, 1905, the agreement dissolving the union of Norway and Sweden, p 20,055

**Karnak**, a great temple in Egypt situated on the right bank of the Nile, one and a half m n of the modern village of Luxor. An avenue of ram-headed sphinxes leads up to the great gateway which opens on to the beautiful temple of Chensu, recently excavated. Slightly to the n e are the ruins of the main temple. The great propylaea leading from one court to another are of magnificent proportions, the total breadth of the largest being 370 ft and its height 142 1-2 ft, while its depth is 60 ft. The processional hall surpasses all in size. There is a central avenue of twelve columns 80 ft high, with nine lines of smaller columns on either side—134 in all and the whole is profusely decorated with carving and brilliant coloring. It was erected by Seti I and finished by Rameses II (19th dynasty). East of the hall is a court surrounded by Osiride figures in which are two huge red granite obelisks. Other temples are near the main building.

**Károlyi**, **Michael**, Count (1875- ), Hungarian statesman, belonging to a famous family of Hungary. After the First World War commenced he founded the Károlyi party for the purpose of breaking with Germany and negotiating a separate peace. In 1918 when the War was plainly lost he became premier and later was proclaimed president of the People's Republic of Hungary. His attempts to re-

store order and contentment were frustrated by Bolshevik propaganda and in 1919 he handed over the reins of government to Bela Kun, and went to Czechoslovakia. He afterward visited the United States. He was later publicly tried by the High Court of Hungary and found guilty of treason and felony and his estates were confiscated. He wrote *The Struggle for Peace* (1924) and his autobiography *Fighting the World* (1926).

**Karr**, **Jean Baptiste Alphonse** (1808 90), French novelist and journalist. His *Sous les tilleuls* (1832), an autobiographical romance, full of originality, freshness, and fantastic humor, brought him fame and was followed by *Une heure trop tard* (1833), *Fa dièse* (1834), which furnished Jules Sandeau and Emile Augier with the ideas for their comedy *La pierre de touche*, *Vendredi soir* (1835) and *Le chemin le plus court* (1836).

**Karoo**, the tablelands which form successive terraces between the seashore and the high veld of the interior of Cape Colony. In summer the Karroo is a desolate, arid plain, its only trees being a species of acacia, but when the rains come the whole surface of the Karroo appears one immense ocean of dark green, spangled with innumerable brilliant flowers.

**Kars**, city, capital of the province of Kars in Turkey. It is strongly fortified and has an ancient citadel and an 11th century cathedral, p 35,000

**Karst**, a name given to the limestone plateau which joins the East Alps to the Dinanic Alps of Istria, but the term has been extended to include the whole of the porous limestone to the Morea in Greece. Karst phenomena with sinks, cañons, and caverns, are found wherever soluble limestone exists in regions which are not too dry.

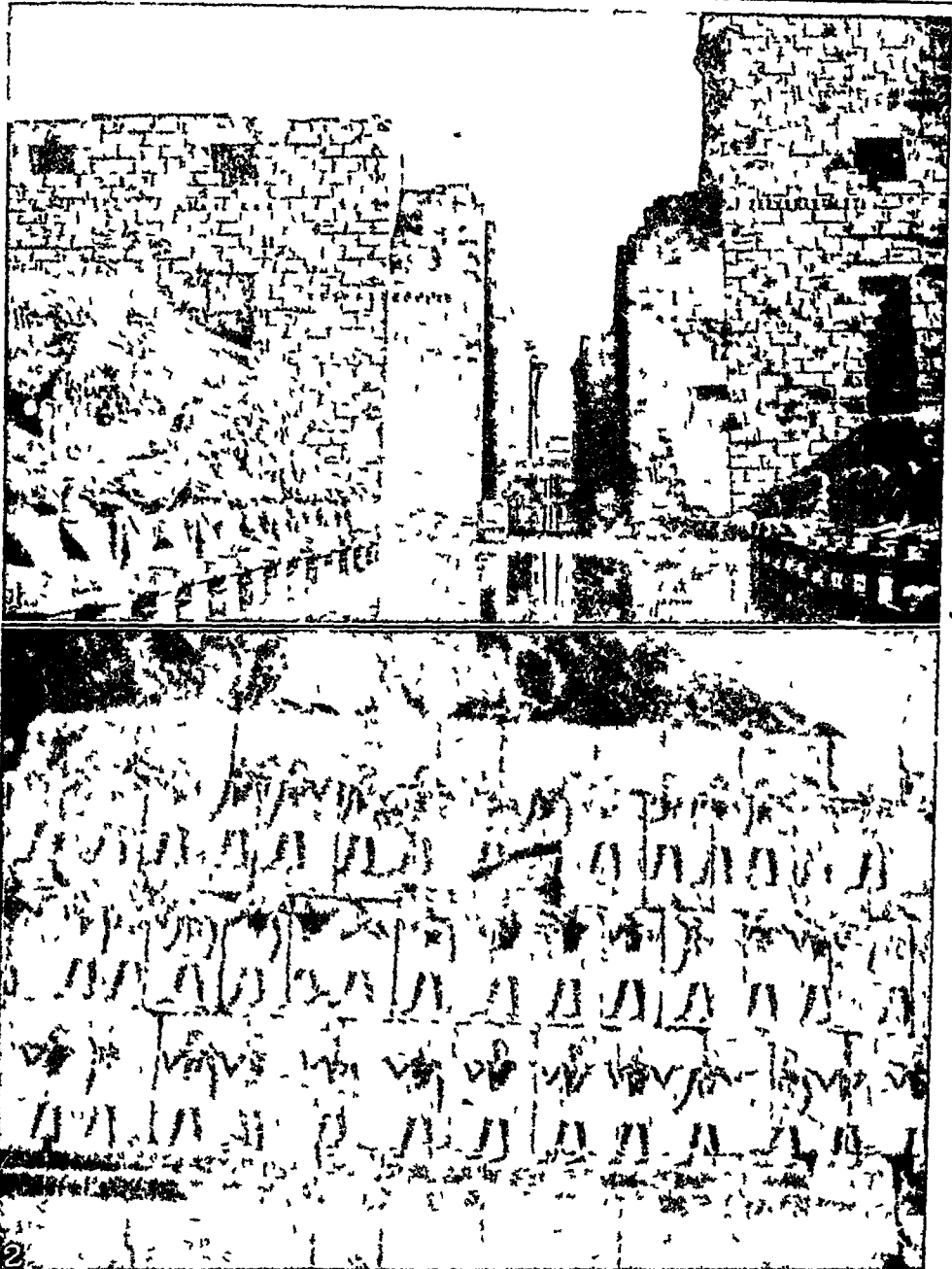
**Kartikeya**, the Hindu god of war, according to some legends was the second son of Siva and Parvati. In others he is of miraculous birth without any direct intervention of a woman. He is renowned for prowess in battle.

**Karwar**, or **Carwar**, seaport, India, capital of the district of North Kanara, Bombay. Formerly one of the principal harbors of the Bombay Presidency, its importance has been reduced since the opening of railways, p 17,000

**Kaschau**, or **Kosice**, town, Czechoslovakia. A remarkably fine cathedral (14th to 15th century), the district museum, and mineral springs are the principal features. It has steam mills, and manufactures tobacco, paper, machinery, furniture, and textiles, p 52,898

**Kashan**, town, Iran, in Kashan province,





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*Runs at Karnak*

1 The Avenue of Sphinxes at the entrance to the Temple of Karnak, Luxor 2 The subject races (Negroes and Asiatics) pictured on one of the walls of the Temple of Karnak

on the route between Teheran and Ispahan. It has manufactures of silks, satins, brocades, copper ware, glazed tiles, and carpets, p 15,000

Kashgar, chief town of East Turkestan. It

stands at the meeting-place of several important and ancient routes, and thus has considerable strategical, commercial, and social importance. It is composed of two parts—the *Kuhna-hahr*, or old town, and the *Yanglu*

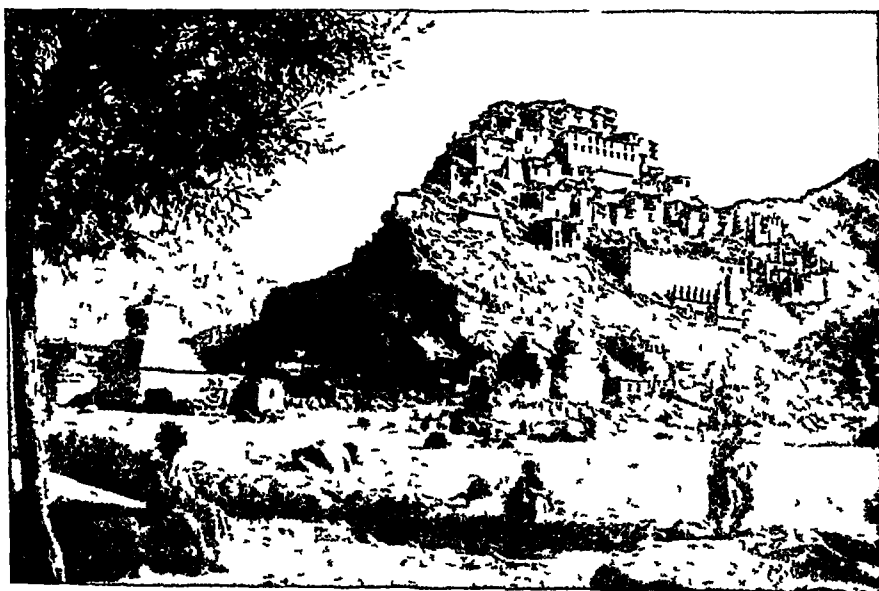
shahr, or new town. The old town, built about 1513, is encircled with a high clay wall. The governor's palace and a caravanserai are the chief buildings. The new town built in or about 1838 is also fortified with massive clay walls. Its chief edifice is the palace of the *amban*, or Chinese governor. It has manufactures of carpets, cottons, cloth, and gold and silver ware, p estimated 60,000 to 70,000.

Kashmir and Jammu, also Cashmere, feudatory state of India. Except at the extreme south the country is very mountainous and has many peaks of more than 25,000 ft

Kassaba, or Casaba, town, Asiatic Turkey, in the vilayet of Aidin, 50 m s e of Konieh. Also a town in Asia Minor.

Kassai, or Kasai, river, Central Africa, rises in Portuguese West Africa, and flows e, then n, forming the boundary between Portuguese West Africa and the Congo Free State for nearly 300 m. After a further course of over 500 m in a northwesterly direction it is joined by the Kwango to form the Kwa. Wissmann explored it in 1885 and it is navigable to the falls bearing his name.

Kassel, or Cassel, town, Prussia. The prin-



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*Buddhist Monastery at Leh, Kashmir. It dates back many centuries.*

The Indus is the chief river. The soil is fairly fertile and the state has a salubrious climate, varied and picturesque scenery, and a good supply of game. Besides shawl-weaving, the making of saddlery, woolen fabrics, silk embroideries, gold and silver ornaments, and copper ware are the leading industries. The capital is Srinagar. At one time *Nagas* (serpent-worshippers), the Kashmiris came successively under Buddhism, Hinduism, and Mohammedanism, the latter being still the faith professed by the bulk of the population. The country is subject to British control, p 3,320,518.

Kashubic, a Slav dialect, resembling Polish, spoken by nearly a quarter of a million of people in and near Danzig.

capital square is flanked by the former palace of the electors and two museums, but the most imposing buildings are those of the administration and the law courts. Another impressive structure is the picture gallery with a splendid collection of pictures. The palace in which Jerome, brother of Napoleon, lived when king of Westphalia, is now partly given up to the Academy of the Fine Arts, and partly to military offices. The Karl Park (416) contains the Orangery palace, with famous marble baths. The industries include a variety of manufacturing and gardening, p 217,000.

Kasson, John Adam (1822-1910), American lawyer and political leader. As commissioner from the United States he negotiated postal conventions with Great Britain, Ger-

many, France, Italy, Switzerland, Belgium, and Holland (1867). He was United States minister to Austria-Hungary (1877-81), and to Germany (1884-5), and a special envoy of the United States to the Samoan International Conference in 1893, and served in other official capacities. He published *A History of the Formation of the United States Constitution* (1889), and *Evolution of the U S Constitution and History of the Monroe Doctrine* (1904).

**Katahdin, Mount**, the highest mountain in Maine, 5,200 ft above sea level. It is 77 m n w of Bangor.

**Kater, Henry** (1777-1835), English physicist. He proved the superiority of the Cassagrainian to the Gregorian telescope, invented the floating collimator, and determined the length of a seconds pendulum. He left writings on measures, balances, pendulums, and the Russian standards of length.

**Katherine**. See **Catherine**.

**Kathiawar**, peninsula on the west coast of India, between the Gulf of Cutch and the Gulf of Cambay, area 20,882 sq m. It contains 187 feudatory states subject to Bombay. It is fertile and well watered. Cotton, the chief product, is exported, p 2,542,000.

**Katkoff**, or **Katkov**, **Mikhail Nikiforovich** (1820-87), Russian journalist. He founded (1856) the *Russki Vestnik*, to advocate reform, but, alarmed by an insurrection in Poland, he became the apostle of the Russification of the whole empire. Through this and the *Moscow Gazette*, which he acquired in 1863, he gained great influence throughout Russia.

**Katmai, Mount**, the largest active volcano in the world, Alaska, 50 m n w of Kodiak Island. It is about 7,500 ft high. In June, 1912, it suffered one of the most violent eruptions ever recorded, felt hundreds of miles away. The eruption was followed by the appearance of the *Valley of Ten Thousand Smokes*, which with its surroundings comprising an area of 1,700 sq m, has been set aside as the Katmai National Monument.

**Kato, Taka-akira** (1859-1926), Japanese statesman, was born in Nagoya. He was graduated from the Imperial Tokyo University in 1881 and entered the Foreign Office in 1886, subsequently being transferred to the Finance Department. He was minister to England in 1894-99 and again in 1908-13, minister of foreign affairs in 1900-01, and again in 1912-15, and premier in 1924-6.

**Katrine, Loch**, lake, Scotland. It is 8 m long, with an average breadth of about a mile and it discharges through Lochs Acrae and Vennachar to river Teith. Since 1859 it has

furnished Glasgow with its water supply. The surface was then raised five ft, and as a result the 'Silver Strand,' immortalized in Scott's *Lady of the Lake*, was submerged, and Ellen's Isle diminished in extent.

**Katsura, Taro, Prince** (1847-1913), Japanese statesman. He became military attaché to the Japanese Legation in Berlin, 1875-8. He was Vice Minister of the War Office for Japan, 1886-91, and was Governor General of Formosa (1896), Chief Commandant Tokyo Bay Defence (1896-8), War Minister (1898-1900), and Premier of Japan (1901-6). On the downfall of the Saionji ministry in 1909, he served as Premier, until 1911 and again in 1912-13.

**Kattegat**, or **Cattegat**, sound between Sweden and Denmark, connecting the Skager Rack (North Sea), through the Sound, the Great and Little Belts, with the Baltic. It is 150 m long and from 40 to 70 m wide.

**Kattimundoo**, or **Cattimandoo**, a juice obtained from the *Euphorbia Cattimandoo*, a plant which flourishes in the north of the Deccan, India. The juice is analogous to gutta-percha, and, being of a highly adhesive nature, is employed as a cement.

**Katydid**, a popular name for a group of large arboreal American species of Locustidae (green grasshoppers) from the 'song' of the male, which has been syllabled as 'Katy-did, Katy-didn't' and is produced by the rasping of the wing-covers. The females answer by a single sharp 'chirp,' produced by a sudden jerk of the wings. The katydids sing with great persistency in the autumn, sometimes both by day and by night, the day note differing perceptibly from the night note.

**Kauai, Atauai, or Atui**, one of the most northerly of the Hawaiian Is. Coffee, sugar and rice are produced. Its surface is mountainous. Area, 500 sq m, p 20,734.

**Kauffmann, Angelica** (1741-1807), printer, born in Switzerland. After studying in Italy, she travelled, with a reputation already made, to England. Here she executed numerous portraits of leading personages, one of the best being the Princess of Brunswick and her child, and was elected one of the first members of the Royal Academy. She finally married Zucchi, a Venetian painter, and spent her last twenty-five years at Rome. The popularity of her work has largely declined.

**Kaufman, George S** (1889- ), American playwright, was born in Pittsburgh, Pa. He wrote *Butler and Egg Man* (1925) and collaborated in *Beggar on Horseback* (1924) and *You Can't Take It With You* (1936).

**Kaulbach, Wilhelm von** (1805-74). Ger-

man painter. He endeavored to free fresco work from church tyranny by introducing mundane subjects. At Munich he decorated Duke Maximilian's palace with sixteen designs of Amor and Psyche. In 1847 he became director of the Art Academy at Munich.

**Kaunitz, Wenzel Anton, Prince von** (1711-94), Austrian statesman and diplomatist. As ambassador to France (1750), he negotiated the secret alliance between that country and Austria, afterward became chancellor of state and chancellor of Italy and the Netherlands. He founded the Vienna Art School and one or more academies for the training of art pupils.

**Kauri Pine**, a coniferous tree peculiar to New Zealand, and forming its most valuable tree. It attains a height of from 120 ft. to 180 ft., and a diameter of from 5 ft. to 12 ft. The wood is straight-grained, easily worked, and susceptible of a high polish, and is largely exported for use as ship masts, deck boards, furniture, and paving blocks. The tree yields a fine resin, kauri gum, used in varnish-making.

**Kava**, or **Ava**, is a term applied both to a shrub, and to a drink prepared by native Polynesians from the shrub by chewing its root, adding water to the extract thus obtained, and fermenting it.

**Kay** (Fr. *Kai* or *Ke*), of the Arthurian legend, is King Arthur's foster-brother and seneschal, and is represented as a man of bitter and sarcastic tongue. In the *Brut*, after performing many deeds of prowess, he is slain in the war against the Romans. In the evolution of Arthurian legend Kay undergoes a change for the worse. He is occasionally represented as uncle to the queen.

**Kay, John** (fl. 1733-64), English inventor. He invented the extended lathe, the fly-shuttle (1733), and the card-making engine, which revolutionized the staple manufactures of England.

**Kay, John** (1742-1826), Scottish painter and caricaturist, is distinguished for his remarkable caricatures of Edinburgh celebrities and famous Scotsmen of his time. See *Kay's Portraits* (1837, 3d ed. 1877).

**Kayak**, the long, narrow, decked skin canoe of the Eskimos. The *kayik* (*qaique*) of the Bosphorus and the Yakut *kayik* are the same word, although applied to vessels of wood, some of them seven tons burden. The occupant of the Eskimo kayak wears a sealskin or sealgut coat, which itself waterproof, fits over the sides of the circular hold after he is seated, making the canoe secure against the entrance of water. See *Born Central Eskimo*, 6th Rpt. Bureau of American Ethnology.

**Kay-Shuttleworth, Sir James Phillips** (1804-77), founder of English popular education and the system of school inspection by government. A pamphlet which he published in 1832 on *The Moral and Physical Condition of the Working Classes Employed in the Cotton Manufacture in Manchester* led to the adoption by the local authorities of measures tending to sanitary and educational reform. He established at Battersea the first training college for teachers (1839-40).

**Kazan**, capital of Kazan, Tartar autonomous Socialist Republic, Russia. Its Kremlin, or upper city, is surrounded by a stone wall. The church of the Annunciation was founded in 1562, the Brogoroditsk convent, containing the 'Kazan Mother of God,' dates from 1579. Among the other features are the university and a red brick tower, greatly venerated by the Tartars as containing the tomb of a Moslem saint. The principal industries are tanneries, breweries, and distilleries, leather and cloth works, iron and copper foundries, tallow, soap, candle, and sugar manufactories, and naphtha refineries. Kazan is a great river port, ranking next to Nijni Novgorod on the Volga, p. about 259,000.

**Kazvin**, or **Kashin**, town, Iran, capital of the province of the same name. The governor's palace is the most notable building. There are ruins of a royal palace and a mosque built by Haroun el Raschid in the 8th century. Kazvin has manufactures of cotton and iron ware and exports large quantities of raisins and fish. Its camels and horses are celebrated, p. 35,000.

**Kean, Charles John** (?1811-68), English actor, second son of Edmund Kean, made his first appearance upon the stage at Drury Lane (1827). He visited the United States in 1830-3 and acquired a reputation there before attaining popularity in England. A tour round the world with his wife, Ellen Tree, was followed by a few performances in London in 1866. Charles Kean achieved his greatest success in the roles of Louis XI, Louis and Fabian dei Franchi in *The Corsican Brothers* and Mephistopheles.

**Kean, Edmund** (1787-1833), English actor, was born in London, son of a strolling actress. He was associated with the stage from childhood, and made his first great success as Shylock at Drury Lane on Jan. 26, 1814. At the close of his engagement at Drury Lane, he toured successfully in the United States (1820). His habits of heavy drinking weakened him physically and mentally, and in 1833 he collapsed at Covent Garden Theatre, while play-

ing Othello Overmastering passion, bitter cynicism, and the whole grim side of human nature found perfect expression in his acting

**Kean, Ellen Tree** (1805-80), English actress, wife of Charles Kean She was the original Susan in *Black-eyed Susan* (1829), and the original Mariana in *Shenandoah's Wife* (1833) She played in America in 1836-9, and again visited that country after her marriage, playing the heroine at all Kean's performances during the tour

**Kean, John Joseph** (1839-1918), American Roman Catholic prelate, was born in Ireland, and went to the United States in 1846 He

Catholic Protector, two Italian Orphans' Homes, and a new High School Manufactures include thread, linoleum, celluloid, but tons, foundry products, and photographic supplies Market-gardening is carried on, p 39,467

**Kearny, Philip** (1815-62), American soldier, was born in New York City He entered the army as a second lieutenant of dragoons in 1837, was sent to France to study cavalry tactics at the cavalry school at Saumur (1839) and served with the French as a volunteer against the Algerians and Arabs (1839-40) He took part in the Mexican War, where he



*Loch Katrine, Ellen's Isle, and Ben Venue*

was a curate of St Patrick's church, Washington, D C, from 1866 to 1878, and during that period was active in organizing Roman Catholic societies From 1897 to 1900 he was in Rome and in the latter year was made archbishop of Dubuque, Ia, but resigned in 1911 and was made titular archbishop of Cienza

**Kearney, Dennis** (1847-1907), American labor agitator, born in Ireland, started in business as a dry-goods merchant in San Francisco Restrictions in the conduct of his business impelled him in 1877 to begin a movement among laboring men of San Francisco against the competition of Chinese labor, the oppression of capitalists and other grievances His meetings were influential in securing changes in the constitution of California favorable to the laboring interests

**Kearny, town**, New Jersey, a suburb of Newark with which it is connected by a bridge The State Soldiers' Home is situated here, and there are also a Carnegie Library a

lost an arm, and resigned from the army in 1851 In 1859 he served with the French in Italy, and distinguished himself In May, 1861, he re-entered the U S army as brigadier-general of volunteers, and during his short service in the Civil War became known as one of the most skilful and courageous of the leaders on the Federal side He was killed at Chantilly while reconnoitering, on Sept 1, 1862

**Kearny, Stephen Watts** (1794-1848), American soldier uncle of Philip Kearny, was born in Newark N J He served in the War of 1812, became a brigadier-general in 1846 and during the Mexican War effected an easy conquest of New Mexico occupying Santa Fe on August 18, 1846 He then went to California to assume the governorship but he came into conflict with Stockton and Fremont and caused Fremont to be court-martialed for disobedience Later he was governor of Vera Cruz and of Mexico City

**Kearsarge**, a wooden corvette of the U S

navy, built at Portsmouth, N H, and launched in September, 1861 Under the command of Capt John A Winslow, who was ordered to watch the Confederate commerce destroyers in European waters, the famous Confederate cruiser, *Alabama*, was sunk The *Kearsarge* was destroyed by running upon the Roncador reef in the Caribbean Sea, Feb 2, 1864

**Kearsarge, Mount**, mountain, in Merrimack co, New Hampshire, 22 m from Concord, 3,251 ft high The name has also been given to a mountain in Carroll co, but this is properly known as Pequawket

**Keary, Annie** (1825-79), English novelist, wrote *Little Wanderlin*, and other books for children, *Castle Dal* (1875), a novel of Irish life and her best known work, *Heroes of Asgard* (1857), *Early Egyptian History* (1861), and *A Doubting Heart* (1879)

**Keats, John** (1795-1821), English poet, was apprenticed to a surgeon In 1814 he went to London, soon gave up his medical studies, and devoted himself to writing He became acquainted with Leigh Hunt, with whom he lived for a time at Hampstead Heath, and with Shelley, and Haydon, all of whom had great influence over him His health began to fail in 1818, and this fact, added to his hopeless love for Fanny Brawne, greatly influenced his literary output In 1820 he went to Rome, where he died the following February

In his brief life this humbly born cockney youth became first among all latter-day English poets as the poet of beauty Perhaps two-thirds of his poetry could be forfeited without serious loss to English literature It is the superb remainder which gives him his high pre eminence The influence of Keats upon later English poetry has been almost incalculable Consult Milnes' *Life, Letters, and Literary Remains of John Keats* (2 vols), Matthew Arnold's *Appreciation* in Ward's *English Poets*, Amy Lowell's *John Keats*

**Keble, John** (1792-1866), English divine and poet Keble's first poetical work, *The Christian Year*, appeared anonymously in 1827 Its excellence was at once recognized by discriminating critics, and its influence, though not immediately felt, was marked Among his other contributions to literature are his edition of *Hooker's Works* (1836), *Life of Bishop Wilson* (1836) a metrical version of the *Psalms*—*The Oxford Psalter* (1839), *Lyra Innocentium* (1846)

Keble's name is closely associated with the Tractarian or Oxford Movement Keble College, Oxford, opened in 1869, was erected in

the 'poet's honor and to perpetuate his teaching'

**Kecskenét**, city, Hungary It has corn and cattle markets and produces wine, tobacco, soap, and fruit, being particularly famous for its apples and apricots, p 78,748

**Kedah, or Kidah**, Malay state under British protection It extends for 120 m along the west coast of the Malay Peninsula, and covers an area of 3,800 sq m The chief products are rice, rubber, coconuts, and tapioca It is governed by a Sultan, assisted by a British adviser, p 484,933

**Kedge, or Kedge Anchor**, a small anchor used for hauling a ship about a harbor or, when lying at a single anchor, to keep her from overriding it or from swinging in an undesirable direction

**Keeler, James Edward** (1857-1900), American astronomer He was astronomer at Lick University in charge of stellar spectroscopy From 1891 to 1898 he was in charge of the Allegheny Observatory, and in the latter year returned to the Lick Observatory as director His most important work is *Spectroscopic Observations of Nebulae* (1894) He also contributed many articles to the *Astrophysical Journal*, of which he was co-editor

**Keeley, Leslie E** (1836-1900), American physician, the originator of the 'Keeley cure' for drunk and drug addicts, consisting of a preparation containing bichloride of gold

**Keeley, Mrs Mary Ann (Goward)** (1805-99), English comedienne, made her first London appearance in 1825 in the opera *Rosina*, but soon gave up musical performances for drama In 1829 she became the wife of Robert Keeley, with whom she acted in many plays, and with whom she made a successful tour of the United States (1836-7) Mrs Keeley's most popular parts were Smike in *Nicholas Nickleby*, Jack Sheppard, Sairey Gamp, and Nerissa in *The Merchant of Venice*

**Keeley, Robert** (1793-1869), English comedian, was born in London He made his debut in London in 1818, achieved success as Rumfit in Peake's *Duel* (1823), and in the following years attained great popularity In 1829 he married Miss Goward, with whom he was constantly associated on the stage until her retirement in 1859 Keeley was a real comedian, being especially successful in the portrayal of rustic stupidity

**Keelhauling**, a punishment inflicted in the British navy during the 17th and 18th centuries The offender was dragged from one side of the vessel to the other, beneath her

keel, by means of ropes attached to the yard-arms. The practice was frequently fatal.

**Keeling Islands**, or **Cocos Islands**, a group of about twenty atolls in the Indian Ocean, 700 m s w of Sumatra. The principal products are copra and cocoanuts. The islands were annexed by Great Britain in 1856. In 1886 they were placed under the Straits Settlements and in 1903 annexed to Singapore, p 800.

**Keely Motor**, a well-known mechanical fraud based on the invention of one John W. Keely (1837-1898), of Philadelphia, who claimed that his device for generating power would revolutionize the science of mechanics and enable all mechanical operations to be carried on at greatly reduced expense. The invention was before the public from about 1874 until the inventor's death in 1898.

**Keen, William Williams** (1837-1932), American surgeon. His published works include *Surgical Complications and Sequels of Typhoid Fever* (1898), *Animal Experimentation and Medical Progress* (1914), *Treatment of War Wounds* (1917), *I Believe in God and in Evolution* (1922), *Everlasting Life* (1924). He edited various texts and contributed to many medical journals.

**Keene, Charles Samuel** (1823-91), English humorous artist. His first drawings were made for the *Illustrated London News*, but from 1851 he was most closely associated with *Punch*, holding a foremost place among British artists in black and white. He illustrated Douglas Jerrold's *Curtain Lectures* and Charles Reade's *Cloister and the Hearth* (in *Once a Week*). A collection of his drawings, entitled *Our People*, appeared in 1881.

**Keene, Laura** (1820-73), American actress, whose real name was Mary Moss, was born in England. She scored her first success in London, in 1851, as Pauline in *The Lady of Lyons*. The following year she went to the United States, where she became a great popular favorite. About 1856 she established her own theatre in New York City, and there in 1858 she produced the famous play *Our American Cousin*, Joseph Jefferson and Edward A. Sothern playing the leading masculine parts. It was at a performance of this play by her company, at Ford's Theatre in Washington, that Lincoln was assassinated.

**Keeper of the Great Seal**, the Lord High Chancellor of England, who was at first merely the King's chief scribe, entrusted with the seal which was used to authenticate royal documents. The Lord Chancellor is still the holder of the royal seal.

**Keewatin**, provisional district in Northwest Territory, Canada, with an area of 212,824 sq m. It lies between the districts of Mackenzie and Franklin and north of Manitoba.

**Keifer, Joseph Warren** (1836-1932), American soldier and political leader, served on the Union side throughout the Civil War, rising from the rank of major of volunteers (1861) to that of colonel of volunteers (1862), and being brevetted brigadier-general of volunteers (1864), and major-general of volunteers for his service in the final campaign against General Lee. In the Spanish-American War (1898) he was a major-general of volunteers.

**Keightly, Thomas** (1789-1872), Irish historian. He is chiefly known apart from his *Fairy Mythology*, which he published anonymously in 1828) by his various historical manuals. These include *Outlines of History* (1829), *The Mythology of Ancient Greece and Italy* (1831), *History of Greece* (1835), *History of Rome* (1836), *History of England* (1837-9), *History of the Roman Empire* (1840), *History of India* (1846-7).

**Keim, Theodor** (1825-78), German New Testament critic. His main title to fame rests on his *Geschichte Jesu von Nazareth* (1867-72, translated by Ransom as *History of Jesus of Nazareth*, 1876-83), a massive and learned work, reverential in tone, and manifesting rare imaginative power.

**Keiser, Reinhardt** (1674-1739), German composer. His opera *Irene* was produced at the Hamburg Opera House in 1697, and was succeeded by more than one hundred others during his long residence in that city. He has been called the father of German opera, being the first composer to abandon imitation of Italian and French methods.

**Keith, James Francis Edward** (1696-1758), known as Marshal Keith, second son of William, ninth Earl Marischal, was born in Scotland. He took part in Mar's rebellion at Sheriffmuir (1715) and in the expedition which failed at Glenshiel (1719). Then he served for nine years in the Spanish army, but in 1728 transferred his services to Russia. In 1747 he took service under Frederick the Great of Prussia, falling at Hochkirch (1758). His military career in the Prussian army is described in Carlyle's *Frederick the Great*.

**Keith, Sir William** (1680-1749), lieutenant-governor of Pennsylvania and Delaware, was born in Scotland. He obtained a commission as lieutenant-governor of Pennsylvania and Delaware, 1717, and was popular with the people, but became involved and returned to England secretly in 1728, and died in poverty.

ty He published a *History of Virginia* (1738) and various pamphlets, and is said to have been the first to suggest the taxation of the colonies.

**Kekulé, Friedrich August** (1829-96), German chemist Kekulé's work was almost entirely on organic chemistry, centering mainly on the constitution of carbon compounds, in particular of benzene His theories in this respect were the foundation of the most far-reaching advances and discoveries Kekulé was also a great teacher, and wrote an unfinished but model *Lehrbuch der organischen chemie* (3 vols, 1861-7)

**Kelantan**, native state of the Malay Peninsula It is on the east coast and has an area of 5,870 sq m, largely jungle land Gold, galena, tin, and pyrites occur, and rice, coconuts, betel nuts, rubber, bamboo, pepper, and sugar cane are produced Kelantan is under British protection, p 393,983 Occupied by the Japanese, Dec 1941

**Kelat-i-Nadiri**, fortress, Persia, in the province of Khorassan, 60 m n e of Meshed, near the frontier of Russian Turkestan

**Keller, Albert von** (1845-1920), German historical, portrait, and genre painter, was born in Gais, Switzerland Among his best known paintings are the *Raising of the Daughter of Jairus*, *Audience with Louis xv*, *The Judgment of Paris*, *Autumn*, *The Crucifixion*, and *A Roman Bath* His portraits of women are particularly fine

**Keller, Arthur Ignatius** (1866-1924), American artist and illustrator, was born in New York City He exhibited at many expositions and was awarded many prizes and medals Among his best works are *At Mass*, *Lead Kindly Light*, and *The Sisters* He was an illustrator of note

**Keller, Gottfried** (1819-90), Swiss novelist In 1854 he published the biographical novel *Der grüne Heinrich* (70th ed, 1912), and in 1856 *Die Leute von Seldwyla* (73d ed, 1912), a collection of short tales of Zurich life His later works, which have also passed through many editions, include *Zürcher Novellen*, *Das Singspiel*, a novel, and *Martin Salander*, another novel A collected edition of his works appeared in 1889-1904

**Keller, Helen Adams** (1880- ), American author, was born in Tuscumbia, Ala At the age of nineteen months she became totally blind and deaf, following an attack of acute congestion of the stomach and brain When she was seven years old, through the advice of Dr Alexander Graham Bell, Miss Anne Mansfield Sullivan was sent from the Perkins Institute of Boston to superintend her education

Miss Sullivan was afterward her constant companion In 1890 she was taught to speak English articulately, and she afterward became a proficient conversationalist in French and German as well In 1900 she entered Radcliffe College, and four years later was graduated from that institution She subsequently lectured throughout the United States She has been active in raising an endowment fund for the American Foundation for the Blind Her published works include *The Story of My Life* (1902), *Optimism, An Essay* (1903), *The World I Live In* (1908), *The Song of the Stone Wall* (1910), *Out of the Dark* (1913)

**Kelley, Edgar Stillman** (1857-1944), American composer and author, was born in Sparta, Wis Among his chief musical compositions are incidental music for *Macbeth*, *Ben-Hur* and *Prometheus Unbound*, *Puritania* (opera), *Symphony*, *New England*, *Alice in Wonderland*, *Pilgrim's Progress* He is the author of *Chopin the Composer* (1913) and of numerous essays

**Kelley, James Douglas Jerrold** (1847-1922), American naval officer and writer His publications on naval affairs and history include *The Question of Ships*, *Our Navy*, *The Story of Coast Defense*, *The Navy of the United States, 1775-1899*, *The Ship's Company*, *American Men o'War* He was co-author of *Modern Ships of War*, *The Barbary Corsairs*, *The Army and Navy*

**Kelley, William Darrah** (1814-00), American politician, known as PIG-IRON KELLEY, because of his support of the Pennsylvania pig-iron interests, was born in Philadelphia, Pa He left the Democratic Party in 1856 for anti slavery and protectionist reasons, joined the Republicans, and in 1860 was elected to Congress, where he served for twenty years He was prominently associated with protectionist legislation

**Kellgren, Johan Henrik** (1751-95), Swedish poet About 1778, with his friend Lenngren, he established the periodical *Stockholmsposten*, which became a medium of æsthetic discussion and enjoyed great popularity Kellgren's style is still regarded as classical and his satires, especially *Mina Lojen*, are the best of their kind in Swedish literature As a critic, a sort of Scandinavian Voltaire, he exercised influence, delighting by his flashing, caustic wit and his graceful elegance An edition of his *Samlade Skrifter* ('Collected Works') was published in 1884-5

**Kellogg, C ara Louise** (1842-1916), American singer, was born in Sumterville, S C She made her first appearance as Gilda in *Rigo-*



*letto* at the New York Academy of Music (1861). Her Marguerite in Gounod's *Faust* (1864) at the same opera house was her first great success. She appeared in London in 1867, again visiting England in 1872 and 1879. She organized her own English opera company, and subsequently an Italian company, in both of which many famous opera singers received their first recognition. Consult her *Memoirs of an American Primadonna* (1913).

**Kellogg, Frank Billings** (1856-1937), American lawyer and public official, was born in Potsdam, N. Y. He was special counsel for the U. S. Government in a number of important cases, was U. S. Senator from Minnesota from 1917 to 1923, a delegate to the Pan-American congress in Chile (1923), and in December 1923 was appointed U. S. Ambassador to Great Britain. In January 1925 he was



Frank B. Kellogg

named U. S. Secretary of State. In this latter capacity he took a definite, sometimes aggressive stand in foreign affairs. He was instrumental in securing the passage of the 'Pact of Paris' or Kellogg-Briand Pact for outlawing war, signed by 15 nations at Paris in 1928. See PEACE.

**Kellogg, Samuel Henry** (1839-99), American clergyman, was born in Quogue, L. I., N. Y. In 1865 he went as a missionary to India. In 1877 he returned to America, then went back to India (1892), to devote himself to translating the Bible and other works into the Hindu dialects. His publications include *The Light of Asia* and *The Light of the World* (1882) and *The Genesis and Growth of Religion* (1892).

**Kellogg, Vernon Lyman** (1867-1937), American zoologist. Among his numerous writings are *American Insects* (1904), *Darwinism Today* (1907), *Human Life as the Biologist Sees It* (1922), *Mind and Heredity* (1923), *Evolution* (1924).

**Kells**, town, Ireland. It contains much of interest to the antiquarian, including an old church tower (rebuilt 1578), a round tower, St. Columba's house, and three or four crosses. The *Book of Kells*, an elaborately ornamented 8th century copy of the gospels, now preserved in Trinity College, Dublin, p. 2395.

**Kelly, Colin P., Jr.** (1915-41) Army flier, first U. S. air hero of World War II.

**Kelly, Howard Atwood** (1858-1943), American surgeon and gynecologist, was born in Camden, N. J. He became consulting gynecologist of Johns Hopkins Hospital in 1919. He has written extensively on gynecology and abdominal surgery.

**Kelly, James Edward** (1855-1933), American sculptor, was born in New York City, and while apprenticed to a wood engraver studied in the schools of the Academy of Design. He was one of the organizers of the Art Students League. In 1875, with Edwin A. Abbey, he established at New York his famous wood-engraving studio, where Cole and other well-known engravers were associated with him. He subsequently turned his attention to sculpture and exhibited his statuette, *Sheridan's Ride*, at the Academy of Design, 1879. Other works are the bas-reliefs for the Monmouth monument, statue of *General Grant at Donelson* (1886), *General Sherman*, and *Colonel Roosevelt at San Juan Hill*.

**Kelly, William** (1811-88), American inventor, was born in Pittsburgh, Pa. He early developed a taste for mechanics and began the manufacture of cast and forged iron at the Eddyville works in Kentucky (1846). He was the first to convert melted cast-iron into malleable steel by blowing air in jets through the mass in fusion (1847), a process which he patented and which became known as 'Kelly's air-boiling process'. Kelly is said to have been the first to import Chinese laborers into the United States, his object being to replace slave labor.

**Kelp**, the name applied to the seaweeds *Fucus* and *Laminaria* and to the ash obtained by drying and burning these. This ash was formerly valued for its sodium carbonate content and for its potash and iodine, but since the discovery of cheaper sources of these substances it has largely lost its importance and its production has greatly fallen off. Drift kelp is now the only variety used as a source of iodine. The chief use of kelp at the present time is as a fertilizer.

**Kelp Crab**, a rather large, maoid crab of the California coast, which inhabits rocky, weed-covered shores. It is edible.

**Kelp Fish**, a small edible fish, about sixteen inches long, obtained from the kelp beds off the Californian coast. It is related to the blennies.

**Kelpie**, in Scottish tradition an awful aquatic creature emerging from its native element to pursue human prey. By some it is identified with the water horse which lured its victims to the body of water where it dwelt and there devoured them.

**Kelso**, town, Scotland. Its chief points of interest are the ruins of the Abbey, founded by David I about 1130, and the Museum, which contains objects of local interest. Floors Castle, the magnificent seat of the Dukes of Roxburgh, is not far from the town. The principal industries are the manufacture of agricultural machinery and fishing tackle, and flour milling. St James' Fair is held annually in August, p 4,009.

**Kelung**, seaport, Formosa, China, at the head of a deep bay. It is connected by rail with several nearby cities. There are coal mines in the vicinity, and coal, rice, camphor, and ground-nut oil are exported, p 17,000.

**Kelvin**, William Thomson, Lord (1824-1907), English mathematician and physicist. His research work includes all branches of mathematical and practical physics. His principal work, however, was done in the field of electricity and magnetism, the first fruit of which appeared in the paper he published in 1845 on the laws of electrostatics, and was greatly developed in his researches on electrodynamics and submarine telegraphy. Practical applications of these theoretical investigations were made in his work in connection with the Atlantic and other cables from 1857 to 1879, and in his numerous inventions, which include the reflecting galvanometer, the siphon recorder, several forms of electrometer, the ampere balance, electrostatic voltmeter, and electric-supply meters. He also took much interest in navigation, and in this connection invented an improved form of mariner's compass and a sounding-machine, besides working out methods for compass correction and for the investigation of tidal phenomena. In addition to three series of monographs—*Electrostatics and Magnetism* (ed 1884), *Mathematical and Physical Papers* (1882-4), and *Popular Addresses*—he published *Baltimore Lectures on Molecular Dynamics and Wave Theory of Light* (1904).

**Kemal**, Mustapha (1881-1938), Turkish political leader, was born in Salonica. He was sent with a cavalry regiment to Damascus, where he was active in the organization of

local branches of the Society of Liberty, and was subsequently in Salonica, where he merged the Society of Liberty into the Committee of Union and Progress. Kemal participated in the Young Turks' revolution of 1908. At the beginning of World War I he was dispatched to the Dardanelles, where he achieved the most brilliant success of his military career. He was later transferred to the Russian front. For his statement of his opinion in regard to Germany, and his own country's perilous position, he was exiled to Germany, but was recalled to a command in Palestine, which he reached just as Allenby's victory brought the Empire to defeat.

Having long since broken with the Committee of Union and Progress, Kemal took up headquarters in Angora, and there became the leader of a new Nationalist party, which organized a National Assembly. By the middle of 1922 the government of Angora had become the *de facto* government of Turkey. He became president of the new Turkish Republic in 1924. He has been given credit for many reforms including the abolition of polygamy and the veil for women, and the formation of new codes of law. Instituted use of surnames, taking 'Ataturk' for himself. See **TURKEY**.

**Kemble**, Elizabeth (1761-1836), English actress, daughter of Roger Kemble, and sister of Mrs Siddons, made her first appearance on the stage as Portia, at Drury Lane, in 1783. In 1785 she married Mr Whitlock, an actor, and in 1792 went with him to the United States, where she became very popular. She returned to London in 1807, reappeared at the Drury Lane, and soon thereafter retired.

**Kemble**, Frances Anne (1809-93), English actress and writer known as Fanny Kemble, daughter of Charles Kemble. She made her first appearance on the stage in 1829, when her Juliet at Covent Garden proved an extraordinary success. She went to the United States in 1832, and two years later married Pierce Butler, of Philadelphia. In 1847, she left her husband and returned to England. In 1849 she returned to the United States, and except for brief appearances on the stage and as a Shakespearean reader, she lived subsequently in retirement. She published poems, two plays, and six autobiographical works, the best known of which are *Records of a Girlhood* (1878), *Records of a Later Life* (1882), and *Further Records, 1848-83* (1890).

**Kemble**, Gouverneur (1786-1875), American manufacturer, was born in New York City. He served as U S consul at Cadiz and as business agent of the government at Medi-

terranean ports during the war with Algeria (1815). He was a Democratic member of Congress (1837-75), and filled other public offices. He was a friend of Washington Irving and James K. Paulding, and owner of the house near Newark, N. J., celebrated as 'Cockloft Hall' in *Salmagundi*.

**Kemble, John Mitchell** (1807-57), English philologist and historian, son of Charles Kemble. He published the *Poem of Beowulf* (1833) with translation and notes, which brought him rank as a scholar. Other works are *Code Diplomaticus Ævi Saxonici* (1839-48), containing some 1,400 early English documents, *A History of the Saxons in England* (1849), *The Gospel of St. Matthew in Anglo-Saxon and Northumbrian* (1856), and *Hora Ferales* (1863).

**Kemble, John Philip** (1757-1823), English actor. In 1783 he surprised London by his powerful performance of Hamlet at Drury Lane, after which he played leading tragic roles (Macbeth, Coriolanus, Cato, Othello) for some years. He became manager of Drury Lane (1788-1802), and from 1803-8 was manager and part owner of Covent Garden Theatre, when he ranked as England's greatest living tragic actor, as his sister, Mrs. Siddons, was the greatest actress. Consult Fitzgerald's *Account of the Kemble Family*.

**Kemp, James Furman** (1859-1926), American geologist, was born in New York City. He became connected with Columbia in 1891. He was connected also with the U. S. Geological Survey. He wrote *Ore Deposits of the United States and Canada* (1893-1900) and *Handbook of Rocks* (5th rev. ed. 1922).

**Kempfenfelt, Richard** (1718-82), British rear-admiral. In December 1781 he signalled himself by scattering a French convoy escorted by a powerful fleet, and capturing several merchant ships. He invented a system of signalling which was adopted and improved by Lord Howe.

**Kempis, Thomas à** (c. 1379-1471), religious writer, was born at Kempen, n.w. of Dusseldorf. He spent five years, 1400-5, in the Augustinian house of Mt. St. Agnes, near Zwolle. There, after a year of probation, he assumed the monastic dress, 1406, and in 1413 was ordained priest. At Mt. St. Agnes he lived in tranquillity till his death. Besides the *Imitation*, Thomas is author of *Meditations on Christ's Life*, *The Soul's Soliloquy*, *Garden of Roses*, *Valley of Lilies*, *Lives*, *Tracts*, *Sermons*, *Letters*, and *Hymns*.

**Kempton**, tn. Bavaria, Schwaben, on the Iller. The abbey was founded in 773, the

abbot in 1360 was made a prince of the empire. Here in 1796 the French defeated the Austrians, p. 22,000.

**Ken, Thomas** (1637-1711), English prelate and hymn-writer, was born at one of the Berkhamsteads, Hertfordshire, was one of the 'seven bishops' sent to the Tower in 1691 by James II. Ken wrote many beautiful hymns, such as 'Awake, my soul, and with the sun,' 'Evening Hymn,' and especially the familiar doxology, 'Praise God, from whom all blessings flow.' See *Lives* by Hawkins (1713), and Dean Plumptre (1888-90).

**Kenai Peninsula**, Alaska, between Cook Inlet and the Gulf of Alaska. There are coal mines and gold deposits, and large fish-canning interests.

**Kenath**, Biblical city of Manasseh beyond Jordan, called also Nobah.

**Kendall, Amos** (1789-1869), American politician, born at Dunstable, Mass. During Pres. Jackson's administration he held a minor office in the Treasury Department, 1829-35, was perhaps the most influential of the coterie of the President's advisers known as the 'Kitchen Cabinet,' and was postmaster-general of the U. S. in the cabinets of Presidents Jackson and Van Buren, 1835-40. He founded at Washington, D. C., the Columbian Institution for the Deaf, Dumb and Blind, which in 1864 became the Gallaudet College for the Deaf. See his *Autobiography* (1872).

**Kendall, George Wilkins** (1809-67), American journalist, born at Amherst, N. H. After working as a printer in various newspaper offices, he, in association with F. A. Lumsden, founded the New Orleans *Picayune*. He served on the staff of Gen. Taylor during the Mexican War, and wrote for his paper articles concerning the military operations, probably the first of the modern type of war correspondents in America.

**Kenesaw Mountain**, a mt. in Cobb co., Ga. It is notable on account of a battle fought there on June 27, 1864, between the Union forces, commanded by Gen. Sherman, and the Confederates, under Gen. Joseph E. Johnston.

**Kenilworth**, Market in Warwickshire, England. Ruins still survive of its castle, founded in the time of Henry I. Edward II was imprisoned here. Queen Elizabeth bestowed the castle on Dudley, Earl of Leicester, who here entertained his sovereign with splendid pageants. It was taken by Cromwell and subsequently destroyed.

**Kennebec**, river, Maine, rising in Moosehead Lake and flowing s. to the Atlantic, into which it empties 15 m. s. of Bath. It is navig-

able to Augusta, and its length is about 175 m

**Kennedy, Charles Rann** (1871- ), English dramatist, was born in Derby Among his plays are *The Servant in the House* (1908) His wife is the English actress, Edith Wynne Matthison With her, he heads the Dramatic Department of the Bennett School at Millbrook, N Y, of which he is trustee

**Kennedy, John Pendleton** (1795-1870), American author, was born in Baltimore, Md He was a member of Congress from 1837 to 1845, excepting one term, and was secretary of the navy in 1852-3 He supervised Perry's expedition to Japan and Kane's expedition in search of Franklin

**Kennedy, John Stewart** (1830-1909), Scottish-American banker and philanthropist, was born in Scotland He went to New York in 1856, where he was an official of many financial, railroad charitable, and educational institutions

**Kennedy, Joseph Patrick** (1888- ), American financier, public official, born in Boston and educated at Harvard He was a bank president and an industrialist prior to his appointment to Securities Exchange Commission, 1934, as chairman, appointed chairman of U S Maritime Commission, 1937, Ambassador to Great Britain, 1938-40

**Kennedy, Margaret (Mrs David Davies)** (1896- ), English novelist, was educated at Somerville College, Oxford She wrote *The Constant Nymph* (1924), later dramatized with Basil Dean, *Autumn* (a play) (1937), *The Midas Touch* (1938)

**Kenneth I, Mac Alpin** (d c 860), king of the Scots, conquered the Picts, 846, became Ard Righ, or ruler of the united monarchy, established his chief seat at Scone, and six times invaded Northumbria

**Kenneth II**, (d 995), king of the Scots, warred against the Strathclyde Britons, overran Northumbria to the Tees, and established his sway over the Lothians

**Kenora**, town, Ontario, Canada, county seat of Rainy River district The surrounding district has productive gold mines, the chief industries are lumbering, flour-milling, and fishing Kenora was a Hudson's Bay Post sixty years ago and was incorporated in 1881 Within its limits are extensive water powers which are only partly utilized, p 5407

**Kenosha**, city, Wisconsin, county seat of Kenosha co, on the west shore of Lake Michigan Its chief educational institutions are Kenper Hall and the College of Commerce It is a busy shipping point, with a fine harbor, and has manufactures of furniture, brass goods,

leather goods, typewriters, steel furniture, automobiles, fire apparatus, wire rope, and hosiery, p 48,765

**Kenosis**, a Greek word employed by some theologians of the 4th century to express the transaction of Christ's relinquishment of His proper and original glory and His taking the form of a servant The kenosis would thus be but a particular aspect of the incarnation

**Kenrick, Francis Patrick** (1797-1863), American Roman Catholic prelate, was born in Dublin, Ireland In 1830 he was appointed coadjutor bishop of Philadelphia, where he founded the St Charles Borromeo Seminary He was appointed archbishop of Baltimore in 1851

**Kensal Green**, a noted burial place about 4 m n w of London, England Here are buried the Princess Sophia, the Duke of Cambridge, Sydney Smith, Anthony Trollope, Thomas Hood, Balfe, Leigh Hunt, and Thackeray

**Kensett, John Frederick** (1818-72), American landscape painter, was born in Cheshire, Conn Chief among his landscapes were *View on the Arno* (1848), *Mount Washington from North Conway* (1849), *Sunset on the Adirondacks* (1860) and *New Hampshire Scenery*

**Kensington**, parliamentary borough, a suburb of London Kensington Gardens, the picturesque grounds of Kensington Palace communicate with Hyde Park The Albert Memorial, 1876, is a conspicuous object in the Gardens Other buildings of outstanding interest are St Mary Abbot's Church, Christ Church, Brompton Oratory, the Imperial Institute, the Natural History Museum, the Victoria and Albert Museum and School of Science and Art, and Holland House, p 100,681

**Kent**, maritime co, England, included in part of the administrative county of London Sometimes called the 'Garden of England,' Kent is fertile and well wooded, its forests covering 99,000 acres Agriculture is a leading industry The chalk downs and alluvial lands afford excellent grazing for sheep and cattle Romney Marsh, adjoining the Weald, furnishes especially rich pasture, and has given its name to a noted breed of sheep The oysters of Whitstable and other places are famous Manufactures include paper, bricks, tiles, pottery, cement, beer, malt, and shipbuilding, manufacture of marine engines, and iron founding Ramsgate and Dover are harbors of refuge, the latter is the chief port for Continental traffic, and there are numerous bathing resorts There is an agricultural college at Wye

The county of Kent covers approximately the same area as the Anglo-Saxon kingdom of that name, which lasted from the 5th to the 9th century. Among historical events associated with the county may be noted the murder of Becket in Canterbury Cathedral, 1170, the burning of Sandwich by the French in 1450, and the appearance of the Dutch in the Medway in 1667, p 1,218,565

**Kent**, town, Portage co, Ohio, has excellent water power, and manufactures files, rubber tires and tubes, locks, flour, and motor trucks. Machine shops of the Erie Railroad are located here. It is the seat of Kent State Normal College, p 8,581

**Kent, Edward Augustus, Duke of** (1767-1820), fourth son of George III and father of

the author of *Wilderness* (1920), *Voyaging* (1924), and *This Is My Own* (1940)

**Kent's Mountains**, or **Kent's Mountains**, in Northern Mongolia, near the Siberian frontier

**Kentigern, St**, or **St Mungo** (?518-603), the apostle of Cumbria and bishop of Strathclyde. Kentigern first founded Glasgow Cathedral, St Mungo

**Kent Island**, Queen Anne co, Maryland, the largest island in Chesapeake Bay, was settled by Claiborne in 1631, being the first colony in Maryland, p 2,196

**Kenton, Simon** (1755-1836), American pioneer, was born in Fauquier co, Va. He was associated with Simon Girty, George Yeager, and other pioneers, winning a reputation dur-



Photo from Ewing Galloway, N Y

Kenilworth Castle

Queen Victoria. Prince Edward Island was named in his honor

**Kent, George Edward Alexander Edmund, Duke of** (1902-1942), youngest son of George V of England. He visited Canada and the U S as Ambassador of Empire. He was killed in an airplane accident.

**Kent, James** (1763-1847), American jurist, born in Fredericksburgh, N Y. He served 2 terms in the N Y legislature, and was professor of law at Columbia College, 1793-7. He was re-elected to the State legislature, 1796, was recorder of N Y, 1797-8, judge of the State Supreme Court, 1798-1804, chief justice, 1804-14.

**Kent, Rockwell** (1882- ) American architect, painter and author, was born at Tarrytown Heights, New York. He was

ing the Revolution by his frontier service with Boone and Clark.

**Kent's Cavern**, or **Kent's Hole**, hillside cave near Torquay, Southwest England. It has yielded, 1865-80, bones of the cave lion, cave hyæna, mammoth, woolly rhinoceros, wild bull, Irish elk, reindeer, grizzly bear, wildcat, horse, and beaver, intermingled with shells, ashes, charcoal, and human implements of stone and bone. Archaeologists infer that the latter were made by people similar to the 'reindeer men' of the French caves, and that human life was contemporaneous with various species of now extinct mammals.

**Kentucky**, popularly called the 'Blue Grass State,' a South Central State of the United States. It is bounded on the n by the Ohio River, touching Illinois, Indiana, and



*Kentucky*

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The Greek memorial building sheltering the Lincoln Cabin at Hodgenville. In this tiny cabin (shown, in its original state, in the inset) the Great Emancipator was born.

Ohio, on the e by Virginia and the Big Sandy River, which separates it from West Virginia, on the s by Tennessee and Virginia, and on the w by the Mississippi River, which separates it from Missouri. Kentucky lies wholly within the Mississippi basin, and over ninety per cent of its area is in the watershed of the Ohio River. In general, its surface is a tableland, sloping from the Alleghanies northwesterly toward the Ohio. The Ohio River, which marks the northern boundary, and the Mississippi, on the western boundary, are the principal waterways of the State. In general, the rivers cut deep, and have steep, rocky banks. There are several natural bridges in the State.

The average annual rainfall is 46 inches—the greatest precipitation being along the southern border. Southerly to westerly winds prevail, and except in the extreme southwest, bordering the swamps, the climate is healthful and agreeable. The soil of Kentucky is almost entirely residual, being formed from disintegrating limestone, shale, and sandstone. The very fertile soil of the famous 'Blue Grass Region,' embracing about 10,150 sq m in the northeastern part, is a heavy clay loam formed from a phosphatic blue limestone. Along the rivers are alluvial deposits of great fertility, aggregating about 800 sq m. The soils of the northwest, formed from weathered sandstone and limestone, are less fertile, yet only a few thousand square miles of the total area are unsuited to agriculture. The oldest geological formations are in the Blue Grass Region, and belong to the base of the Trenton series. They consist mainly of phosphatic limestones. That portion w of the Tennessee River differs greatly from the remainder of the State, a sudden subsidence, apparently, having allowed the deposit of Cretaceous and Tertiary formations. Kentucky ranks high in the production of fluorspar and asphalt, mineral pigments, bituminous coal, petroleum and natural gas. There are two great coal fields in the State, one a part of the Middle Appalachian fields, comprising about 8,000 sq m in various eastern and southeastern counties, the other, a section of the Eastern Interior field, comprising approximately 5,000 sq m of Western Kentucky. The total area of forest lands is approximately 10,000,000 acres. The chief varieties are chestnut, oak, yellow poplar, gum, hickory, beech and some pine.

Much of the industrial importance of the State is to be attributed to its great agricultural and mineral resources, affording a supply of cheap fuel, and to its efficient means of transportation, particularly over its many rivers.

The grain raised in the State is utilized in its flour- and grist-mills, while the slaughtering and meat packing industries centring at Louisville are supplied by live stock from Kentucky farms. The numerous tanneries prosper largely because of the native supply of oak bark. The manufacture of distilled and malt liquors is a leading industry.

The principal manufactures and products, besides those referred to, are lumber and timber, tobacco, cars and shop construction and repairs by steam railways, iron and steel, foundry and machine shop output, printing and publishing, men's clothing, bread and bakery products, boots and shoes, cooperage, bricks, tiles, terra cotta and confectionery. There are also manufactures of patent medicines, paints and varnish, cotton goods, furniture, woolen and felt goods, cordage, and marble and stone work.

Kentucky is well favored with means of water transportation, having about 4,000 m of navigable rivers. The Ohio River on the n and the Mississippi on the w have been of great commercial and industrial importance from the earliest pioneer days. The Cumberland and Tennessee Rivers are navigable for steamboats across the State. The Kentucky and Licking are each similarly navigable for 100 m. Canals around the falls on the Ohio at Louisville and at various points on the other rivers facilitate traffic.

According to the Sixteenth Census, April 1, 1940, the population of Kentucky was 2,845,627. Louisville, the largest city, had a population of 319,077. The second city in the State was Covington, with 62,018 inhabitants. School attendance is compulsory in both cities and rural districts for the entire school term for children between the ages of seven and sixteen. Separate schools are maintained for white and for colored children. The Kentucky State University, supporting an agricultural and a mechanical college, is located at Lexington. Higher education is also afforded through private and denominational colleges and universities, among which are Berea College, at Berea, Georgetown College, at Georgetown, Central University of Kentucky, at Danville, University of Louisville, at Louisville, Georgetown College, Bethel Female College, at Hopkinsville, and St. Mary's College at St. Mary's. The State provides for the instruction and training of white teachers in four State normal schools and colleges, and at the Kentucky Normal and Industrial Institute for Colored Persons at Frankfort, and Western Kentucky Industrial College, Paducah. Simmons Uni-

versity, Louisville, is also a colored institution

The present constitution of Kentucky, adopted in 1891, may be amended by the consent of three-fifths of the members elected to each house of the legislature, providing a majority of the electorate concur. The executive power is vested in a Governor, Lieutenant-Governor, Secretary of State, Treasurer, Auditor, Attorney-General, Superintendent of Public Instruction, and Commissioner of Agriculture, all of whom are chosen for four years. The legislature comprises a House of Representatives, consisting of 100 members, chosen for two years, and a Senate of 38 members, chosen for four years. Sessions are held biennially, and are limited to sixty days. The judiciary consists of a Court of Appeals, consisting of not less than five nor more than seven justices, Circuit Courts, Quarterly, Fiscal, and County Courts.

Kentucky takes its name from the Indian word *Kan-tuck-hee*, to which various meanings have been assigned, the one commonly accepted being 'dark and bloody land'. The first white man known to have entered Kentucky was the French explorer La Salle, who passed down the Ohio River in 1669. The French signified their claim to the region by sending troops from Canada to punish hostile acts of the Kentucky Chickasaws in 1739. The Ohio Company, organized to exploit the Ohio Valley, aroused by the rumors of its occupation by the French, prevailed on the governor of Virginia, 1752, to send George Washington there, with a message to the French commander. The reply he received was the occasion for the French and Indian War.

The first settlement was not made until 1774, Harrodsburg, although the region had been previously visited by several explorers, including a party of hunters, among whom were John Finley and Daniel Boone. For several years the settlers in the territory were continually harassed by Indian uprisings. In 1775 a colonization scheme was inaugurated by Richard Henderson, who induced the Cherokee Indians to give up a section of land. Through the efforts of George Rogers Clark, the region, then a part of Fincastle co., Virginia, was made Kentucky co.

In 1780 immigration received a great impetus from 300 boats coming down the Ohio carrying 3,000 persons. Kentucky was divided into three counties, and a few years later a movement was set on foot aiming toward separation from Virginia and admission to statehood. Virginia for a long time refused to consent to the separation and it was not until

1789 that the necessary legislation was enacted. On June 4, 1792, Kentucky entered the Union.

At the outbreak of the Civil War, Kentucky at first refused to take sides. Governor Magoffin protested to both the Federal and the Confederate governments against the military occupation of any part of the State, and endeavored to have Kentucky named as the mediator between North and South. His wishes were not complied with, however, and the elections held in the spring and early summer of 1861 gave evidence that not only were the people opposed to maintaining a position of neutrality, but that they largely sympathized with the Union cause. The first important engagement fought in the State was at Mill Spring on Jan. 19, 1862, between the Confederates under Zollicoffer and the Federals under Thomas. Another engagement took place at Perryville on Oct. 8, 1862, in which the Federals under Buell won a strategic victory over the Confederates under Bragg. This gave the Federals possession of the State. See WPA Writers' Project, *Kentucky* (1939).

**Kentucky Resolutions**, passed by the legislature of Kentucky in 1798 and 1799, were directed against the Alien and Sedition Acts. Similar resolutions were passed by the Virginia legislature. Consult Warfield's *Kentucky Resolutions of 1798*.

**Kentucky River**, formed by the junction of three forks at Proctor, Lee co., Kentucky, and running in a winding north-westerly course of about 250 m. to Carrollton, where it joins the Ohio River.

**Kentucky, University of**, a non sectarian State institution for both sexes at Lexington, Ky., founded in 1865 under the provisions of the Morrill Act. It has a Graduate School, Colleges of Arts and Science, Agriculture, Engineering, Law, and Education. See **UNIVERSITY**.

**Kenya**, extinct volcano, Kenya Colony, immediately to the S. of the Equator. It is cleft at the summit into two points, Batian and Nelion. The summit was attained in 1899 by Mackinder.

**Kenya Colony and Protectorate**, British crown colony in Central East Africa, on the Indian Ocean, extends from the Umba to the Juba River, and inland as far as Uganda. Its total area is 224,960 sq. m. The interior is a vast plateau, gradually rising from the coast to between 3,000 and 6,000 ft. above the sea. The chief rivers are the Juba, the Tana, and the Sabaki.

The climate on the coast is tropical, on the



plateau a comparatively cool day is succeeded by a pleasantly cool night

Пшеница, ячмень, wheat, corn, and barley are grown here. The agricultural products of the lowlands are essentially tropical, and include rice, native grains, coffee, cotton, cassava, and coconuts, also cinnamon, pineapples, sugar cane, tobacco, vanilla, simsim, nutmegs, limes, citrons, and dates. The cultivation of sisal hemp and rubber is being engaged in on a large scale. Ostrich farming is an established industry, and sheep raising is proving profitable.

The merchantable forest area extends over 3,600 sq. m., yielding rubber, fibres, castor oil, timber, bamboos, olives, and figs. Manganese, opals, graphite, marble, and limestone have been found, and deposits of nitron and diatomite occur in the Rift Valley. Gold has been discovered in the Masai Reserve. The population in 1939 was estimated at 3,366,000. The whole colony and protectorate is under the control of a governor and commander-in-chief, with legislative and executive councils.

In 1886 the region now constituting Kenya Colony and Protectorate came under British dominion, and the British East Africa Association was formed, and incorporated, 1888, as the Imperial British East Africa Company. In 1895 control was transferred to the Foreign Office and in 1905 to the Colonial Office. It was known as the East Africa Protectorate. In 1920, by Order in Council the Protectorate, except the domains of the Sultan of Zanzibar, was annexed to the crown. Those Zanzibar domains form the Kenya Protectorate.

**Kenyon, Doris** (1898- ), actress, author, born in Syracuse, N. Y. She made her debut in 1915 in *The Princess Pat* and was leading lady in *The Girl in the Limousine*. She was starred in many motion pictures including *The Hidden Hand*, *Thief in Paradise* and *Up the Ladder*.

**Kenyon College**, a Protestant Episcopal institution of higher learning at Gambier, Ohio.

**Keokuk**, city, Iowa, one of the county seats of Lee co., on the Mississippi River, at the foot of the Des Moines Rapids. Keokuk is the centre of a rich agricultural region, and has a considerable trade in agricultural products. The chief industries are reworking butter and the manufacture of starch, glucose, patent medicines, cereals, flour, lumber, clothing, and canned goods. There is a large pickling establishment for poultry, butter and eggs.

The Des Moines Rapids furnish water power, and are avoided by a navigable canal

constructed by the Federal government in 1877. A concrete dam makes the Mississippi navigable for 65 m., p. 15,076.

**Kephir**, the national beverage of the peoples of the Caucasus, prepared by the action of a peculiar fungus known as 'kephir grains' on cow's milk. Afterward, when kept in closed vessels, the changed milk undergoes fermentation. It is a thickish liquid, similar to kumps, refreshing, and very sustaining.

**Kepler, Johann** (1571-1630), German astronomer, was born in Wurtemberg. His *Astronomia Nova*, 1609, contained the laws that the planets describe ellipses about the sun, whose centre is a focus, and that the radius vector of each planet sweeps over equal areas in equal times.

He published in 1618-21 an epitome of the Copernican astronomy, and in 1619 his *Harmonices Mundi, Libri V*, in which he announced his law, that the squares of the planetary periods are as the cubes of their distances from the sun. Kepler wrote also two works on optics, the *Paralipomena* to Vitellio (1604), and *Dioptrice* (1611), recommending in the latter the construction of telescopes with two convex lenses, *Stereometria*, which gives him a place among the founders of the infinitesimal calculus, and *De Cometis* (1610-20) treating of the great comets of 1607 and 1618. Consult *Lives* by Brewster, Muller, and Gunther.

**Keppler, Joseph** (1838-94), American caricaturist, was born in Vienna, Austria. He came to the United States in 1868, and established a German periodical in St. Louis. This did not prove successful and he removed to New York, where in 1877, with Adolph Schwarzmann, he began the publication of the weekly comic illustrated paper, *Puck*. His caricatures, dealing with political and social questions of the day, had much influence on public opinion.

**Kerak**, an old town in Transjordan. The fort, founded by the Crusaders in 1131 and captured by Saladin in 1188, is now used as a barracks, though partly in ruins.

**Kerason**, or **Kerasund**, town, Asia Minor, on the Black Sea, has a fortress and two small churches dating from Byzantine times, p. 93,000, Greeks, Turks, and a few Armenians.

**Keratin**, a substance which occurs in the outer layers of the epidermis in vertebrates, as well as in such structures as the nails, hairs, and the scales of reptiles and fishes. Chemically it belongs to the group of the albuminoids.

**Keratitis**, inflammation of the cornea.

**Kerbela**, town, south Iraq, w. of the

Euphrates, near the ruins of Babylon The tomb of Hussein, the son of Ali, is a place of pilgrimage for Shute Mohammedans, who also carry their dead there for burial It is a prosperous and growing trade centre Dates and cereals are exported, and sacred bricks and shrouds stamped with verses from the Koran are the chief manufactured products, p 65,000

**Kerch (Kertch)**, town, seaport, and fortress, Russia, at the eastern extremity of the Crimean peninsula on the Strait of Kerch or Yenikale, which connects the Black Sea and the Sea of Azov, p 35,000

**Kerensky, Alexander Feodorovitch**, (1881- ), Russian revolutionist He was one of the leaders in the resistance to the Tsar's decree dissolving the Duma on March 12, 1917, and he was Minister of Justice in the provisional government after the Revolution, one of his first acts in this capacity being the release of all political prisoners in Siberia He was made Minister of War and led the army in the Russian offensive of July, 1917 On July 20, 1917, he succeeded Prince G E Lvoff as Premier, but fled during the Bolshevik upheaval Afterwards he travelled through Europe, finally establishing an anti-Bolshevik newspaper in Paris On a tour in the U S, 1928, he lectured on anti-Bolshevik propaganda

**Kerguelen Island, or Desolation Island**, an archipelago in the Indian Ocean, containing, besides the main island, about 300 islets The face is mountainous and glaciated, with many cascades and deeply indented shores The climate is severe The peculiar Kerguelen cabbage is valued by sailors as a preventive of scurvy Seals, whales, and fish are abundant in the neighboring waters The island was discovered in 1772 by a Breton sailor, Kerguelen-Tremarec It was annexed by France in 1893 and made a dependency of Madagascar in 1924

**Kermadec Islands**, group of small volcanic islands in the Pacific Ocean, belonging to New Zealand, between 29°10' and 31° 30' s lat

**Kerman, or Kirman**, province of Southern Iran, with Baluchistan on the e and the Gulf of Omrin on the s The Desert of Kerman occupies the n and n e, and the remainder is mostly barren

**Kermanshah**, a province of North western Iran There are few roads, and little wheeled traffic, mules and camels are used for transportation Almonds, gums, raw wool and silk, carpets, opium, are exported, p 425 000

**Kermes, Chermes**, an evergreen shrub of Palestine and the Mediterranean countries It is infested with an insect from which is obtained a scarlet dye-stuff, now largely superseded by cochineal

**Kermesse, Kirmess, or Kermis**, a festival, usually lasting a week, celebrated in parts of Belgium, Holland, and Northern France Originally a procession of thanksgiving for the founding or restoration of a church, it has lost much of its ecclesiastical character, and has become a form of carnival

**Kern, Jerome** (1885-1945), composer, was born in New York City He studied piano under Alexander Lambert and Paolo Gallico, and harmony under Dr Austin Pierce Among his compositions are *Very Good*, *Eddie* (1915), *Beauty Prize* (1923), *The Cat and the Fiddle* (1932) In 1927 he wrote the music for *Show Boat*, *Roberta* (1934) His song *Ol' Man River* was very popular

**Kernahan, Coulson** (1858- ), Irish critic and writer, was born in Devonshire He wrote numerous books, among them being *Dead Man's Diary* (1890), *A World Without a Child* (1905), *Five More Living Poets* (1928), *A Dog and His Master* (1932) Some of his works have been translated into 18 languages, also in Braille for the blind

**Kerosene**, an illuminating oil distilled from petroleum by means of sulphuric acid and caustic soda After re-distillation it may be divided into two portions ordinary oil, burning at about 110° F, and 'water-white' oil, burning at 150° F Kerosene oil has also been distilled from bituminous coal, wood, asphaltum, and other mineral hydrocarbons See PETROLEUM

**Kerr, Philip Henry, Marquess of Lothian** (1882-1940), British ambassador to U S He was secretary to Prime Minister David Lloyd George during the World War (1914-1918) He was very wealthy, holding large property interests in England and Scotland He became ambassador to U S, Aug 1939, succeeding Sir Ronald Lindsay He was a supporter of the 1938 Munich pact

**Kerria**, a monotypic genus of plants belonging to the order Rosaceae

**Kerry**, maritime county, province of Munster, independent Eire Its coast line is broken by two large peninsulas, by Dingle Bay and Kenmare River, and by Tralee, Bantry, and Ballinskelligs Bays, and Smerwick, Castlemaine, and Valentia Harbors The surface is low in the north, but in the main wild and mountainous, and very picturesque The

principal mountains are Macgillicuddy's Reeks with Carruntuohill the highest summit in Ireland, Mangerton and Brindon Lakes include the celebrated Killarney Lakes. Sulphur, amethysts, marble, coal, and slate are found. Oats and potatoes form the principal crops, and sheep and cattle are numerous, p 149, 171

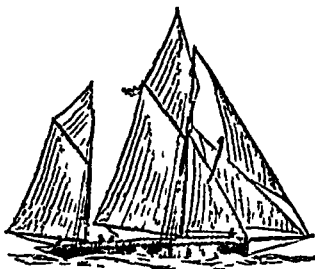
**Kertch, Russia** See **Kerch**

**Kerulen**, river, Northeast Mongolia, one of the head streams of the Amur, flows mostly through the northern outskirts of the Gobi to its junction with the Argun or Khular below the Dalai-nor or Kulunnor

**Késmark**, ancient town, Hungary, county Szepes, contains the Tokoly Castle, is noted for its manufactures of linen

**Kester**, Paul (1870-1933), American dramatist, was born in Delaware, O. Among the plays written by him are *The Countess Rou-dine*, *Lamar*, *When Knighthood Was in Flower*, *Dorothy Vernon of Haddon Hall*, *Don Quixote* and *Lady Deadlock*

**Kestrel**, a group of species of the genus *Falco*, sometimes erected into a separate genus *Tinnunculus*, and distinguished by the bell-like note and the pattern of the plumage. They are widely distributed over Europe, Asia, and Africa, and have even been taken in Massachusetts. In North America, however, the species is replaced by the sparrow-hawk and similar forms



*Modern Ketch*

**Ketch**, in its older sense, a stoutly-built square rigged, two-masted craft, at one time common in the Mediterranean and used especially as a bomb-vessel. The term is applied at the present day, especially in Europe, to a two-masted, fore- and aft-rigged craft, in which the mizzen is considerably shorter than the fore mast

**Ketones**, a series of hydrocarbon derivatives, in which two, either similar or different, alkyls are united to a carbonyl (CO) group. Ketones are prepared by oxidizing secondary alcohols, or by heating the calcium salt of a fatty acid—acetone being prepared on the

large scale from calcium acetate in this way. Ketones are stable compounds that on reduction yield secondary alcohols, and unite with acid sulphites, to form crystalline derivatives. They break up on oxidation.

**Ketshwyo** See **Cetywyo**

**Kettle Creek**, Wilkes co., Georgia, was the scene of a small but fierce battle in the American Revolutionary War. Here, on Feb 14, 1779, Colonel Andrew Pickens, with about 400 Militia encountered a band of nearly 800 Loyalists from the Carolinas, on their way to join the British at Augusta, Ga. In the fight which ensued Colonel Boyd the leader was defeated and killed with 75 men, while Pickens lost only 38 men.

**Keuper**, the uppermost subdivision of the Triassic system of Europe, consists essentially of beds of limestone, marls, gypsum, and sandstone, and in England attains a thickness of 2,000 ft.

**Kew**, suburban metropolitan dist., Surrey, England, on the Thames. The church on Kew Green, built in 1713, contains the mausoleum of the first Duke and Duchess of Cambridge, and in the churchyard is the grave of the painter Gainsborough. The Royal Botanic Garden was founded by the dowager Princess of Wales in 1759. The area at that time was only about eleven acres. In 1840 Queen Victoria resigned the gardens for the public benefit. Since that time immense improvements have been effected, and the area now amounts to 345 acres. The Temperate House, completed in 1899, is probably the largest plant-house in the world. In 1897 Queen Victoria handed over Kew Palace and the Queen's Cottage to the nation. At Kew Observatory, Richmond, chronometers and other scientific instruments are tested, p 4,362

**Keweenaw Series** A group of rocks exposed in the Lake Superior region and comprising sandstones, conglomerates, limestones and interbedded lava flows. They are usually classed as Precambrian, though lying at the top of this system.

**Kewkiang** See **Kiukiang**

**Key**, in music, signifies the scale in which a composition is written. Key is also a name given to the outward termination of the levers in key-board instruments, to the levers controlling valves in certain wind instruments, and to the appliance used in tuning pianos and harps.

**Key** See **Locks**

**Key**, in engineering, a general term denoting anything that fastens, and frequently a small steel bar in the shape of a wedge.

**Key, David McKendree** (1824-1900), American politician and jurist, born in Greene co., Tenn. He was a member of the U. S. Senate, 1875-7, postmaster-general in the cabinet of President Hayes, 1877-80, and judge of the Eastern District of Tennessee, 1880-95.

**Key, Ellen (Karolina Sofia)** (1849-1926), Swedish author, was born in Sundsholm, Smöland. She interested herself especially in women's welfare and progress, and was known for her advanced views on that subject.

**Key, Francis Scott** (1780-1843), American lawyer and poet, was born in Frederick co., Md. While detained on board a British vessel, during the bombardment of Fort Mifflin, near Baltimore, 1814, he witnessed the action celebrated in his song, 'The Star-Spangled Banner,' written the next morning.

**Key Dwellers**, the name given by archaeologists to an extinct race formerly inhabiting the islets or keys lying off the coast of Florida.

**Keynes, John Maynard** (1883-1946), English economist, whose *The Economic Consequences of the Peace* (1919) created a sensation by its forthright condemnation of the penalties imposed upon Germany at Versailles and its caustic pen pictures of the principal peace negotiators—Lloyd George, Wilson and Clemenceau. He represented the British Treasury at the Peace Conference, but returned to London to write the book, which won a worldwide circulation in a few months. The work was published at his own expense and its success was compared with that of *Uncle Tom's Cabin*. Keynes's heterodox economics came into prominence again in the great industrial depression which began in 1929. He believed intelligent planning could solve the world's problems. He criticized England's banking system and commended the New Deal monetary policies of President Roosevelt. Keynes favored large capital outlays to combat the depression, declaring America could spend its way back to prosperity.

**Keyser, Jakob Rudolf** (1803-64), Norwegian author, was born in Christiania. In 1847 he wrote *Nordmændenes Religionsforfatning i Hedendommen*, and in 1856-8 published *Den norske Kirkes Historie under Katholicismen*.

**Keyserling, Herman, Count** (1880-1946), German philosopher. After the Russian revolution he was deprived of his estates. He wrote *The Travel Diary of a Philosopher* (1925), *America Set Free* (1929).

**Keystone State**, popular name of Pennsylvania.

**Key West**, a city and port of entry, Florida,

county seat of Monroe co., on Key West Island, in the Gulf of Mexico. Key West is a popular winter and health resort, the average winter temperature being 72°. Features of interest include the U. S. Biological and Weather Bureau Stations, naval yard, 'turtle crawls,' a convent, Casar Maraton, the Martello Towers, and the burial spot of many victims of the *Mame* sponge fishing is important. The U. S. Navy has a large base here. A fresh-water supply was piped from the mainland in 1942, p. 25,000.

**Khabarovsk**, administrative center of the Far East Region of Soviet Russia, in Siberia, at the confluence of the Amur and Ussuri rivers, is a centre of the fur trade, p. 49,316.

**Khabur**, river, Asiatic Minor, rises in the Karagah Mountains, and flows 200 m. to the south through Mesopotamia, to join the Euphrates at Kerkisrah.

**Khafra, Cephren, or Saophis**, an Egyptian king of the fourth dynasty, who built the second of the three pyramids, and the small temple behind the great Sphinx.

**Khaibar**, or usually **Khyber Pass**, defile, 33 m. in length, between Northwest India and Afghanistan, through the Safed Koh mountain range. It forms part of the route between Peshawar and Kabul, and at Jamrud, the eastern end, is 450 ft. wide, at the fort of Ali Masjid, 9½ m. farther on, it is only 40 ft. wide. It is the only pass on the northwestern frontier practicable for artillery, and is consequently of great strategic importance.

**Khairagarh**, native state, Central Provinces, India, is extremely fertile and produces wheat and rice, p. 155,471.

**Khaki**, originally a stout twilled cotton, but now made also of wool, and in various shades, such as light brown, olive drab, or dust-color. It was first used by British troops in India in 1848. The olive drab shade was adopted by the U. S. Army in the Spanish-American War, and is still used for the service uniform.

**Khama** (?1827-1898) a Christianized African chief, became head of the Bechuanaland tribe of Bamangwatos in 1872 and ruled his people with wisdom and kindness.

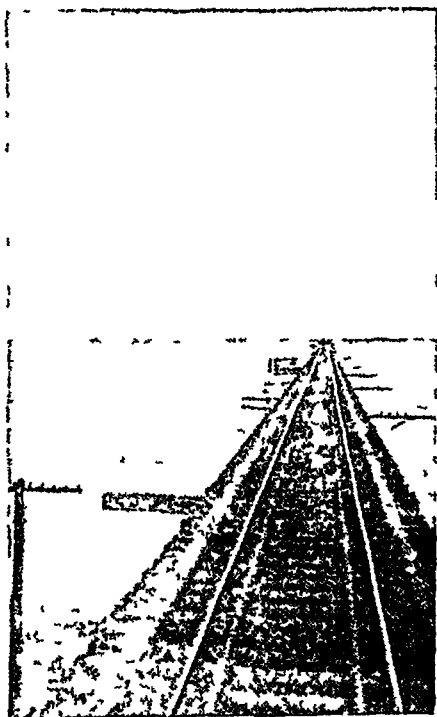
**Khammurabi, or Hammurabi**, a king of Babylon. His reign is variously dated between 2400 and 2000 B. C., and is reputed by some to have lasted forty-three and by others fifty-five years.

**Khandesh**, district, Bombay, India.

**Khan-Tengri**, or **Tengri Khan**, or **Kar-Gol-Bas**, in Asia, highest mountain in Tian Shan system, e. of Issikkul, and s. of the

li River Its highest point reaches 23,950 ft

**Kharbin**, Russian for **Harbin**, railway centre in Manchuria, on the Sungari, the principal tributary of the Amur At Harbin the trans-Siberian railway bifurcates, one branch going to Vladivostok, and the other to Mukden, Dairen and Port Arthur (with a line to Tientsin connected by rail with Peiping) Harbin is the centre of a rich agricultural and grazing district, and has large mineral fields



*Former Oversea Railway to Key West, Fla., replaced, 1940, by Oversea Highway*

yet undeveloped Founded in 1898, it has been well planned and built in modern European style, with electric tramways and lighting system Harbin was an important place in the Russo-Japanese War (1904-5) After the battle of Mukden it became the reserve depot and the chief base for the Russian army, p 332,690 (See **HARBIN**)

**Kharkov**, prov, Ukraine USSR, p 2,000,000 Kharkov, city, cap of prov, p 415,000

**Khartum**, town, Egyptian Sudan, situated on the tongue of land at the junction of the Blue and White Niles The present town dates from 1898, when it was rebuilt according to plans designed by Lord Kitchener Features of interest are the palace of the governor general, the military hospital, Gordon Memorial College, and the Church of All Saints, p 31,965

**Khasi and Jaintia Hills** See **Jaintia Hills**

**Khatmandu**, capital of Nepal, India The maharaja's palace is the chief building, p 51,000

**Khaya**, a genus of tall trees belonging to the order Meliaceae, and closely allied to the mahogany tree

**Khayyam**, Omar See **Omar Khayyam**

**Khazars**, an ancient, semi-nomadic people of Turco-Finnish origin, who formed a kingdom in Southern Russia, 190-1020

**Khedive**, the official title of the hereditary viceroy of Egypt from 1867 to 1914 It was discontinued in December, 1914, when Great Britain declared a British Protectorate over Egypt, deposed the Khedive Abbas Hilmi, and conferred the title Sultan of Egypt upon Hussein Kamil In 1922 the Sultan was proclaimed king See **EGYPT**

**Khelat** or **Kalat**, native state and city, Northeastern Baluchistan The state is for the most part barren, arid, and sparsely populated It is the centre of several caravan routes and has a large domestic trade, p 14,000

**Kherson**, a district center in Soviet Russia, bordering on the Black Sea, having the Dnieper for its eastern boundary and the Dniester for its western The soil towards the s is steppe-land, in the n, where it touches the 'black earth' region, it is more fertile Cattle raising is the chief occupation, p 3,447,100

**Kherson**, city, Ukraine, capital of the government of Kherson, contains an observatory, a marine training college, and two shipyards The chief industries are wool-cleansing, tobacco manufacturing, milling, and soap making, p 58,809

**Khingon**, a chain of mountains in Eastern Asia, including two ranges—Great Khingon and Little Khingon Great Khingon separates the Gobi desert plateau from Manchuria Little Khingon lies mainly to the s of the Middle Amur, and e of the Great Khingon The Little Khingon proper does not exceed 3,300 ft, but in the hills that unite the two ranges there are heights of 4,800 ft

**Khios** See **Chios**

**Khiva**, a former khanate of Russia in Central Asia, now the center of the Khorezm District of the Uzbek, Soviet Russia The chief oasis in which the capital, Khiva, is situated stretches from the mouth of the Ovas to Amudarya for 200 m along its banks Corn, barley, rice, millet, cotton, pease, lentils, tobacco, hemp, poppies, and madder are cultivated and fruit trees abound Fine breeds of horses, sheep and camels are raised, p 519,500

**Khmers** See **Cambodia**

**Khoi**, town, Azerbaijan, Iran, on the trade route between Tibriz and Trebizond, p 75,000

**Khoi Khor** See **Hottentot**

**Khojak Pass**, a mountain pass at an altitude of 5,000 ft, leading through the Khoja Amran range, between the British district of Pishin, Baluchistan, and Afghanistan

**Khokand**, town, a former capital of Turkistan. It was annexed by Russia in 1876, and now is a district center and important city of the Terghana District, Soviet Russia. The chief industries are paper making, and the raising of cotton, wheat, rice and barley, p 65,000

**Kholm**, in Poland, has a magnificent cathedral and an ancient castle, p 2, 1

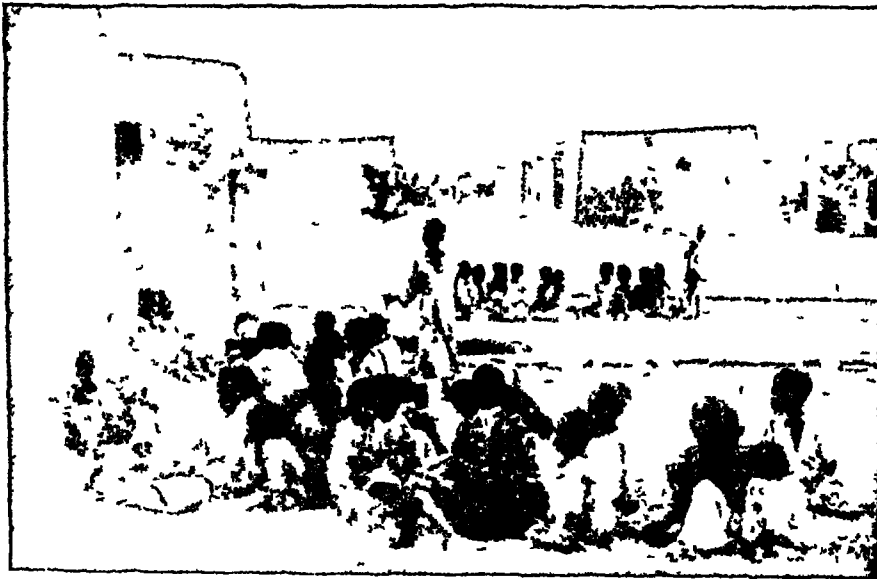
**Khotin**, or **Khocim**, town, Ukraine, in Bessarabia, now a government of S.W. Russia, but a part of Rumania at one time, situated on the S. side of the Dniester. It is the seat of a fruit and grain trade, p 20,000

**Khufu** See **Cheops**

**Khuzistan**, or **Arabistan**, province of southwestern Iran, between the northern extremity of the Persian Gulf and the Bakhtiari Mountains. Rice, maize, barley, dates, cotton, wool and indigo are produced, p 200,000

**Khyber Pass** See **Khaibar Pass**

**Kiakhta**, town of the former Russian province of Iranshahr in Siberia, now Soviet Russia. It is an important trading center, especially for tea, p 5,000



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*Khartum. Classes of Natives in front of huts in Native Quarter*

**Khonds**, a primitive people of Kolarian stock who inhabit Bengal and the eastern parts of the Central Provinces of India

**Khorassan**, the largest province of Iran, bordering on Afghanistan. The chief products are grain, cotton, silk, hemp, tobacco, aromatic and medicinal plants, fruits and wine. Salt, gold, silver and precious stones, especially turquoises, occur and camels, horses, and asses are raised, p 900,000

**Khotan**, now a part of Sinkiang, or new Dominion of China. The district is rich in gold and jade, manufactures include silks, carpets, and jade ware, p 50,000

**Kiang** See **Ass**

**Kiangsi**, province, Central China, with an area of 69,180 sq. m. The surface is generally mountainous and is watered by the Kan and other rivers. Rice, wheat, silk, cotton, tea, tobacco, and sugar are produced in the valleys, porcelain is manufactured in large quantities at King-te-chen, there is much valuable timber in the mountains, and there are deposits of coal, copper and iron, p 24,466,800

**Kiangsu**, maritime province, China, lying along the Yellow Sea, with Shanghai on the N. It is traversed by the Yangtze River and is

intersected in every direction by canals, including the best portion of the Grand Canal. Though desolated by the Taping rebellion, the province is now one of the richest in China. The soil is alluvial, and produces large quantities of rice, wheat, beans, cotton, silk, and peaches. There are valuable salt deposits and coal, plumbago, iron, and marble are found in the mountains. Extensive cotton mills are in operation, p 28,235,864

#### Kiangyin See Chiangyin

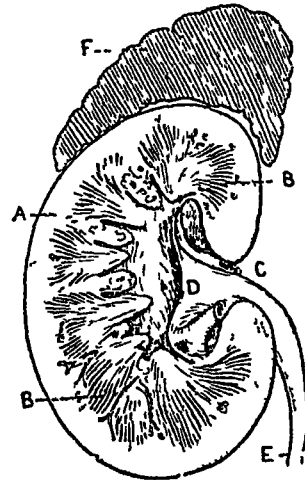
**Kiaochow**, or **Chiaochow**, the name of a town, harbor, and district on the southern coast of the Shantung Peninsula, China. In 1898, as indemnity for the murder of two German missionaries, the bay and surrounding coasts were leased for ninety-nine years to Germany. The town of Kiaochow was itself outside the leased territory but within the German sphere of influence. Early in World War I Japan bombarded the fortress of Tsingtau and forced the Germans to surrender possession of the protectorate. The Peace Treaty provided that Germany should renounce in favor of Japan all the rights and privileges in Kiaochow which she had obtained from China in 1898. This provision caused much dissatisfaction in China, and the Chinese delegates to the Peace Conference refused to sign the treaty. At the Washington Conference in 1922 an agreement was reached with Japan whereby the leased territory and all public property, for which Japan was compensated, was returned to China, and the Tsingtao-Tsinan Railroad was sold by Japan to China.

**Kidderminster**, municipal and parliamentary borough, England, in Worcestershire, near the confluence of the Stour with the Severn. The manufacture of carpets, introduced about 1735, is still the staple industry, p 27,122

**Kidnaping**, the common-law offence of wrongfully carrying off and detaining any person from those entitled to his society or custody. The offence was formerly punishable in the State in which the crime was committed, and subject to the laws of that state. Public opinion, following the kidnaping and death of the son of Col. Lindbergh, compelled the passage of the so-called Lindbergh act, which makes kidnaping a federal offence punishable by long terms of imprisonment. As a result the Federal agencies began to move rapidly against this form of crime. J. Edgar Hoover, Director of the Div. of Investigation, U. S. Dept. of Justice, is a conspicuous figure in this movement. Through the efforts of this department, by the end of 1934, 74 persons had

been convicted, 2 were sentenced to death, 16 to life imprisonment, and sentences totaling 1,186 years were given to the rest. The Dillinger gang was broken up and 'Ma' Barker and her son Fred were trapped and killed in their Florida hideout, leaving Alvin Karpis as the only major kidnaper not in the hands of the 614 Department of Justice Agents. Karpis was captured in 1936, pleaded guilty and sentenced to life imprisonment. See UNITED STATES HISTORY.

**Kidneys**, excretory organs whose function is to get rid of nitrogenous waste. Among invertebrates, the commonest form of excretory organ is a small coiled tube, communicating, primitively at least, with the body cavity internally, and also with the exterior. In an annelid—the earthworm—are a series of such tubes, each with its own internal and external



*Section of Human Kidney*

A, Cortical substance, BB, pyramids, C, hilum, D, pelvis, E, ureter, F, suprarenal capsule

apertures. Such tubes are known as nephridia. With regard to the vertebrate kidney, it consists of a compact mass of small tubules, which open externally into a common duct—the ureter, which conveys their products to the exterior, in many cases through a urinary bladder. In order that they may adequately fulfil their function, the tubules are abundantly supplied with blood-vessels. But in the higher vertebrates, reptiles, birds, and mammals, the tubules are much more complex in structure than in lower forms, and development shows that they are not homologous with those constituting the kidney in lower forms. In man, the kidneys are two excretory organs situated

in the back part of the abdomen, one on each side of the lumbar portion of the spinal column. Each is somewhat bean shaped, presenting its concave border towards the spine. The peritoneum covers their anterior aspect. In the central part of the concave border is a notch known as the hilum, through which enter the blood-vessels, nerves, and lymphatics, and from which arises the ureter or excretory duct. Over the upper end of each kidney is situated a small ductless gland, the supra-renal capsule. The function of the kidneys is the secretion of urine, which consists of water containing urea and the various other waste products that result from body metabolism, and are carried to the kidney by the blood in the renal arteries. The kidney cells have the power of picking up urea and other poisons from the blood and passing them into the kidney pelvis, the purified blood being returned to the circulation by the renal veins. The average amount of urine secreted in twenty-four hours is fifty ounces, containing about 500 grains of urea and a similar quantity of other solids. When the fluids of the body are diminished by free perspiration or by diarrhea, the urine is also diminished in quantity, but may be concentrated and high colored from the relatively high proportion of solids. The other solids consist chiefly of phosphates, urates, chlorides, sulphates, oxalates and uric acid, with traces of more complex substances.

**Kidney Vetch, or Lady's Finger**, a name given to plants belonging to the genus *Anthyllus*, of the order Leguminosae.

**Kidron**, or **Cedron**, a stream of water, Palestine, flowing through the valley of Jehoshaphat, then e between Jerusalem and Mount of Olives to the Dead Sea.

**Kieff**. See **Kiev**.

**Kieft, Willem** (?-1647), Dutch merchant who was director general of New Netherland from 1638 to 1647. His administration was marked by a disastrous Indian war, 1643-5, growing out of Kieft's attempt to tax the Indians along the Hudson, and of the unprovoked massacre, 1643, sanctioned by Kieft, of 110 peaceful river Indians who had come to the Dutch for protection against the Iroquois. This period also saw beginnings of a movement to establish a representative system in New Netherland, two representative bodies the Twelve Men and the Eight Men being chosen by the commonalty, 1641 and 1643 respectively, to advise and cooperate with the director.

**Kiekie**, a New Zealand shrub, *Freycinetia banksii*, belonging to the order Pandanaceae.

It is a high climber, bearing a large quantity of edible berries crowded on a spadix.

**Kiel**, seaport, Prussia, in the province of Schleswig-Holstein, near the Baltic end of the Kaiser Wilhelm Canal. The Thaulow Museum, the former castle of the dukes of Holstein-Gottorp, the provincial museum of antiquities, the university, founded in 1665, the Stadt Theatre and the Neues Rathaus are the chief features of interest. Its industries include shipbuilding, flour, oil, and saw mills, engineering works, and breweries. A free harbor was opened in 1924. By the Treaty of Kiel, 1814, Denmark ceded Norway to Sweden, p. 272,000.

**Kielce**, province, Poland, 11,919 sq. m. The chief minerals are iron, lead, and copper, zinc, coal, calamine, marble, gypsum, clay, and sulphur are also found. The chief industries are potteries, tanneries, tile works, sawmills, flour mills, and manufacture of metal objects, p. 2,535,730.

**Kjelland, Alexander Lange** (1849-1906), Norwegian author, was born in Stavanger. He first made his reputation with the nautical novel, *Garman og Worse* (1880), which was followed in rapid succession by others, including *Else* (1881), *Sne* (1886), *Sankt Hans Fest* (1887), and *Jacob* (1891).

**Kieran, John Francis** (1892- ), newspaper writer, was educated at the College of the City of New York and Fordham University, was sports writer and conducted columns in New York papers, an expert on 'Information Please,' a radio program.

**Kiev**, or **Kieff**, town in the Ukrainian Soviet Socialist Republic established in 1919. The Dnieper borders the town. Millet, hemp, flax, and tobacco, cherries and plums, melons and watermelons are grown. The sugar industry centres here and distilleries, cloth, candles, soap, agricultural implements, and tobacco industries, tanneries, iron foundries, brick works, and paper mills are important. The chief minerals are iron, lignite, graphite, marble, and granite. Features of interest are the catacombs of St. Anthony, the cathedral of St. Sophia, the Vladimir Monument, the monastery of St. Vladimir, Church of Three Sants, cathedral of St. Andrew, the university, cathedral of St. Vladimir, and the museum of antiquities, p. 846,000.

**Kilauea**, volcanic crater on the eastern slope of Mauna Loa, in the island of Hawaii. Although it is only about 16 m. from the more famous crater of Mauna Loa, the eruptions of each have apparently proceeded from independent sources.



**Kilbowie** See *Clydebank*

**Kildare**, county of the province of Leinster, in Ireland. The principal rivers are the Liffey, the Boyne, and the Royal and the Grand Canal cross the county. Agriculture is the leading industry, p 58,028

**Kilimanjaro**, an extinct volcano in Tanganyika Territory, East Africa

**Kilkenny**, inland county of Leinster, in Ireland. The country is drained to Waterford harbor by the Barrow, Nore, and Suir. Agriculture is the chief occupation. Flour, whiskey, and beer are manufactured. Coal is mined and black marble is quarried. Kilkenny is rich in antiquities—cromlechs, raths, ruins of ancient castles, and ecclesiastical buildings,

**Killdeer**, or **Kildeer**, the common plover, widely distributed over North America. It is about 10 inches in length, grayish brown and rusty above, white below, and with two dark bands across the breast and around the neck as its distinctive mark.

**Killer**, a small whale or large dolphin, belonging to the genus *Orca*. It sometimes reaches a length of 20 ft, with a back fin rising six feet in height. It is a savage creature, a swift and powerful swimmer with jaws prolonged into a beak filled with strong teeth, and it voraciously pursues large fish, dolphins, seals, and whales of the smaller sort,—even large ones are attacked and killed by packs of killers working in concert. They are practically



*Lakes of Killarney, Ireland*

including the abbey of Jerpoint, near Thomastown, p 70,990

**Kilkenny**, town, in County Kilkenny, Ireland, on the Nore, 73 m sw of Dublin. Among the points of interest are the cathedral of St Canice founded in the 13th century, churches of St John and St Mary, both ancient, and two monasteries dating from the 13th century. Industries include manufactures of blankets and coarse woolen and linen cloths. There are large marble works near the town.

**Killarney, Lakes of**, group of three connected lakes in County Kerry, Ireland, famous for the beauty of their scenery. The lake is drained to Dingle Bay by the Leane or Laine and contains some richly wooded islands, including Ross, immortalized by Thomas Moore, and Innisfallen, containing slight vestiges of the abbey in which was compiled the *Annals of Innisfallen*. The market town of Killarney, 20 m se of Tralee, is the tourist centre for the lakes, p 5,800

useless, as their blubber contains comparatively little oil. Consult Beddard's *Book of the Whales*.

**Kilian**, St (c 644-697, the apostle of Franconia and bishop of Wurzburg in the 7th century, was one of the Irish missionary-monks who Christianized Western and Central Europe. He converted the Thuringians, but was martyred in Wurzburg.

**Killiecrankie, Pass of**, a mountain pass in Perthshire, Scotland, in the valley of the Garry, 3 m se of Blair Athol. At the northern end of the pass was the scene of the battle fought between the Jacobites under Graham of Claverhouse and the Royalists under Mackay, on July 27, 1689.

**Kilmarnock**, town, in County Dublin, Ireland. It is noteworthy as the scene of the so-called *Kilmarnock Treaty* of 1882, said to have been made between Gladstone and Parnell, who was then imprisoned in the jail.

**Kilmarnock**, town, Ayrshire, Scotland, on

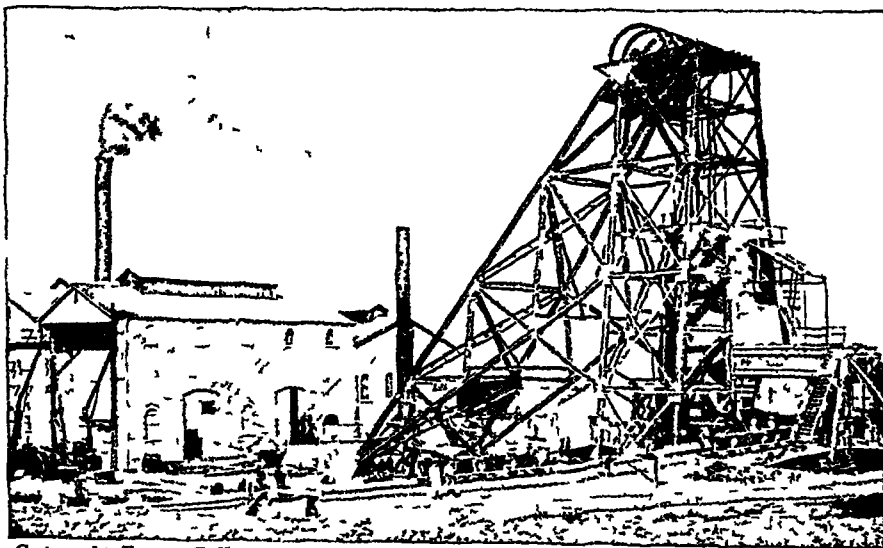
the Irvine and Kilmarnock Waters, is situated in one of the richest mineral fields of Scotland. Its most important industrial establishments are engineering shops and foundries, but it manufactures, also, tweeds, carpets, boots, and shoes. The more important institutions include the Burns Memorial and the Dick Institute, p 38,400

**Kilmer, Joyce** (1886-1918), American poet, was born in New Brunswick, N J. On the outbreak of World War I he enlisted as a private in a New York Regiment and was killed in action during the American advance on the Marne. His death was generally considered to have cut short an unusually promising career.

sumed by a kilowatt in an hour. This is the unit for metering and billing electrical energy.

**Kilpatrick, Hugh Judson** (1836-81), American soldier, was born near Deckertown, N J. He served in the Union army throughout the Civil War, rising from the rank of first lieutenant to that of major-general of volunteers. He commanded Sherman's cavalry during the 'March to the Sea' and through South Carolina and North Carolina. He was U S minister to Chile in 1865-70 and 1881, and died at Valparaiso.

**Kilpatrick, Old**, parish and village, Scotland, in Dumfriesshire. It is said to be the birthplace of St Patrick, 387, p 55,668



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Wessleton Diamond Mine, Kimberley

His wife, Aline Kilmer, was also a poet of distinction. His books include *Summer of Love* (1911), *Trees and Other Poems* (1913), *The Circus and Other Essays* (1916).

**Kiln** See Cement, Lime, Pottery

**Kilo**, properly a prefix used in the metric system to denote one thousand—as kilogram, 1,000 grams, kilometre, 1,000 metres. It is used alone as an abbreviation for kilogram—as 10 kilos for 10 kilograms. See METRIC SYSTEM

**Kilogram** See Metric System

**Kilowatt**, a unit of measurement of electrical power. Its significance is 1,000 watts, and it is equivalent to 1.3406 horsepower.

**Kilowatt-hour**, a common unit of measurement of electrical energy, is the energy con-

sumed by a kilowatt in an hour. This is the unit for metering and billing electrical energy.

**Kilung** See Kelung

**Kilwa-Kivinje**, seaport, Tanganyika Territory, formerly German East Africa, exports rubber and timber. During World War I it was occupied by the British and became the headquarters of one of the British armies in East Africa.

**Kimberley**, chief town and diamond-mining centre of Cape of Good Hope, Union of South Africa, located on the inland desert plateau at an elevation of 4,050 ft, p 39,702. In 1867 an ostrich hunter, named O'Reilly, obtained from a Dutch farmer some diamonds which had been found by children on the banks

of the Vaal. Two years later the 'Star of South Africa', valued at \$100,000, was dug out of the wall of a mud hut at Du Toit's Pan, and within four years ten thousand diggers were working in the wet or alluvial diggings along the banks of the river. Finally, the matrix of the diamonds was discovered in pipes or funnels of unknown depth—probably the craters of ancient volcanoes. On Oct. 15, 1899, Kimberley was besieged by the Boers, and was not relieved until Feb. 16, 1900.

**Kimberley**, gold field, Kimberley district, West Australia. The first discovery of gold in Western Australia was made in this district in 1882, and in 1886 what was known as the Kimberley gold field was proclaimed and reserved for gold mining.

**Kimberley, John Wodehouse, First Earl of** (1826-1902), British statesman, was born in London. In 1852 he entered public life as under-secretary of state for foreign affairs, in 1856-8 was British ambassador to St. Petersburg, became lord-lieutenant of Ireland, 1864-66, served in the Gladstone cabinet as lord privy seal, 1868-70, was made secretary of state for the colonies, 1870-4, 1880-2, and secretary of state for India, 1882-86, 1892-94.

**Kimpolung**, Roumanian. See **Campulung**.

**Kin**, Next of, the nearest relatives of a deceased person, no distinction being made between whole and half blood. The relationship is reckoned by degrees—parent and child are one degree, grandparents and brothers and sisters are two degrees, uncles or aunts three degrees, and first cousins four degrees. Canon law reckons the degree of kinship between collaterals by counting the number of generations between the person farthest removed from the common ancestor and that ancestor; thus, first cousins are in the second degree, a great-uncle in the third degree.

**Kinabalu**, Mount. See **Borneo**.

**Kincardineshire**, or **The Mearns**, maritime county, Scotland, on the coast, between Aberdeenshire and Forfarshire. The county is watered by the Dee, North Esk, and Bervie. Oats, barley, and wheat are the principal crops, while on the coast there is a fishing industry, p. 41,007.

**Kinchinjunga**. See **Kanchanjanga**.

**Kindergarten**, a 'play school' for children between the ages of three and seven, in which the aim is to develop the child's initiative and efficiency through training in self-activity, by means of selected playthings (gifts), occupations (manual work), games, and stories. The term was originally applied by Friedrich

Froebel to a play school established by him in Blankenburg, Germany, 1837. In Germany, Great Britain, and the United States the Froebel kindergarten has been widely adopted, while in many of the larger cities of these countries it has been made an integral part of the public school course. The first kindergarten in America was that of Miss Caroline Louise Frankenburg, established in Columbus, Ohio, in 1858. The pioneers of the movement, however, were Dr. Henry Barnard and Miss Elizabeth Peabody. The first kindergarten in connection with the public schools was opened in Boston in 1870, but St. Louis was foremost in adapting the Froebel system as an organic part of the public school course. In that city Miss Susan Blow established, 1873, a kindergarten training school whose influence has extended throughout the country. In recent years kindergarten methods have become more and more an integral part of the educational system of the American schools. In the course of its adaptation to the public school system, the kindergarten became to some extent formalized. In recent years a 'liberal' school, including many influential educators, has arisen which would adapt kindergarten methods and materials to modern conditions, while doing away with this formalism. The kindergarten has been influential in the adoption of nature study, music, and manual training in graded schools. Consult Hughes' *Froebel's Educational Laws*, Montessori's *The Montessori Method* (Eng. trans. by Anne E. George, 1912), Gesell's *The Pre-school Child* (1923), Garrison's *Permanent Play Material For Young Children* (1926), and Teacher's College, Columbia University, *Experimental Studies in Kindergarten Education* (Vol. XV, No. 1).

**Kinemacolor**. The 'natural color,' moving pictures which have so greatly extended the attractiveness and scope of the cinematograph are obtained and projected with apparatus of the usual type modified in some very important details. The film used is sensitive to all colors of the spectrum. The exposure mechanism of the camera exposes the film thirty-two times a second by means of a revolving shutter, part of which passes only red and part only green rays. The developed strip consists of a string of negatives of the ordinary black-and-white character, but alternately differing in density in different parts. The positive printed off of course, reverses the density values in each case. The projecting apparatus has an interrupting shutter to obscure the lens during the changing period between pictures, and revolving once for every exposure. Instead of being opaque,

it is of a dark violet translucent material. Between interrupter and lens is a second and circular shutter, with blue-green and red sectors separated by two smaller open sectors. This revolves once for every two exposures, the openings coming opposite the lens when the interrupter is in line with one or the other of them. Thus during each change period violet light reaches the sheet to supply the third primary color.

The film is put 'in step' with the circular shutter. Owing to the 'persistence of vision,' objects of intermediate color are represented as such, since their images appear in red and green duly proportioned, and alternating so rapidly as to be blended by the eye into the corresponding composite color. See MOVING PICTURES.

**Kinematics**, a preliminary department of dynamics, in which the geometrical properties of motion are considered independent of the mass of the moving matter, or of the forces associated with the motion. It is, in fact, an extension of geometry in which the element of time is introduced. Displacement, linear or angular, is a purely geometrical conception. When, however, we introduce the notion of time we pass to velocity, linear or angular, and the question becomes a kinematical one.

See VORTEX. Consult Kennedy's *Kinematics of Machinery*, Mc'Gregor's *Kinematics*, Zwet's *Kinematics*.

**Kinetics**, the branch of applied mathematics which treats of the motions of material configurations—or, to speak more logically of the motions of masses. The general division of the subject is discussed under DYNAMICS. The first to formulate a complete theory of kinetics was Newton. Apart from the far-reaching problems of attraction, the most important lines of development of kinetics are the investigation of vibratory and wave motion in systems of connected particles, and the discussion of the properties of crowds of small, quick-moving particles practically free from one another. Consult Gross' *Kinematics and Kinetics*, Zwet's *Kinetics*.

**Kinetophone**, a combination of the cinematograph, and the phonograph, perfected by Thomas A. Edison, by which the motion pictures of the former are reproduced in harmony with their natural sounds, as recorded by the latter. It was the forerunner of the present-day talking picture apparatus. See CINEMATOGRAPH, PHONOGRAPH.

**Kinetoscope**. See **Cinematograph**.

**King**, a title expressing the rulership of a male sovereign. In early times it was usually

bestowed upon the chief warrior of a tribe, and conferred despotic power over the lives and property of his subjects.

**King, Albert Freeman Africanus** (1841-1914), Amer. physician, born in England. He presented the idea of the communication of malaria by mosquitoes, which in 1899 gained scientific recognition. Besides current papers in magazines, Dr. King prepared *A Manual of Obstetrics* (1882) which went through numerous editions.

**King, Basil** (1859-1928), American author, was born in Charlottetown, Canada. He wrote *The Conquest of Fear, Faith and Success*.

**King, Clarence** (1842-1901), American geologist, was born in Newport, R. I. From 1867 to 1872 he was in charge of what was known as the Geological Survey of the Fortieth Parallel—the survey of a belt of territory, between the meridians 104° and 120° W.—and from 1879 to 1881 he was the first director of U. S. Geological Survey, published *Systematic Geology* (1878), and 'The Age of the Earth,' in the *Am. Jour. of Science* (1893).

**King, Ernest J.** (1878- ), American admiral, was born in Lorain, Ohio, educated at Annapolis, served in Spanish-American War and World War I. In World War II he became Commander-in-Chief of Naval Operations (1941-45), Fleet Admiral, 1944, retired and awarded the gold star, 1945.

**King, Henry Churchill** (1858-1934), college president, was born in Hillsdale, Mich. Beginning as a tutor of Latin and mathematics at Oberlin College, he was subsequently professor of philosophy, and dean of the college, becoming its president in 1902. He published *Reconstruction in Theology* (1901), *Theology and the Social Consciousness* (1902), *Religion as Life* (1913), *The Way to Life* (1918), *For a New America in a New World* (1919).

**King, John Alsop** (1788-1867), American political leader, was born in New York City. He was secretary of the U. S. legation at London, 1825-6, serving as *charge d'affaires* for two months in 1826, and was a Whig representative in Congress, 1849-51. He took part in the organization of the Republican party in N. Y., was governor of the State, 1857-9.

**King, Rufus** (1755-1827), American political leader, was born in Scarborough, Me. He was an influential member of the Constitutional Convention of 1787, and in the Massachusetts Convention, of which he was a member did much to bring about the ratification by that body of the Federal Constitution. He re-

moved to New York 1788 was a Federalist member from that State to the U S Senate 1789-96 and 1813-25 was U S minister to Great Britain 1790-1803 and 1825-6, and was the Federalist candidate for vice president in 1804 and 1808. Consult *Life of a Correspondent of the R. A. King* in six volumes edited by C. R. King.

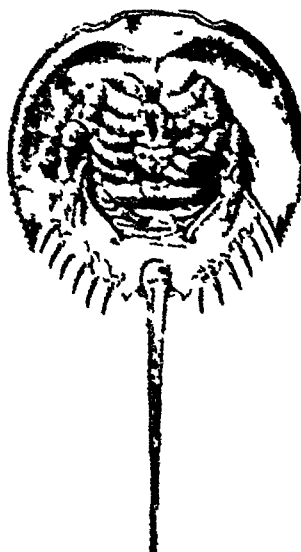
**King, William Lyon Mackenzie** (1874- ), Canadian statesman was born in Berlin, Ontario. After some experience in journalism he entered the civil service, became Deputy-Minister of Labor in the Dominion Government from 1900 to 1905 and first Dominion Minister of Labor from 1906 to 1911. He was afterwards for several years adviser on industrial relations to the Rockefeller Foundation. He succeeded Sir Wilfrid Laurier as leader of the Liberal party in 1919 and served as Prime Minister from 1921 to 1926 except for a few months in 1926. He again became Prime Minister in 1926.

**King, William Rufus** (1780-1853), American political leader, thirteenth vice president of the United States, was born in Sampson co., N. C. He was secretary of the U S legation first in the kingdom of Naples and afterwards in Russia, 1810-18, was U S minister to France, 1844-6, and again served in the U S Senate, 1846-53, of which he was president *pro tempore* in 1850-2. He was nominated as vice president on the ticket with Franklin Pierce and was elected but his health failing he went to Havana, Cuba, where by special act of Congress he was allowed to take the oath of office March 4, 1853. Soon after his return, however, he died at his home near Cambridge.

**Kingbird**, one of the larger of the tyrant flycatchers, very numerous and familiar throughout most of North America. It is blackish above and white below with a conspicuously white-edged tail, and an erectile crest having a flame-colored center.

**King-crab**, or **Horseshoe Crab**, an interesting marine arthropod whose exact zoological position is not quite certain but which is usually placed in the order Xiphosura, the other members of which are extinct. There are five species, which live in shallow water on both sides of the Pacific Ocean, and off the eastern coast of America. The king-crab is probably related to the arachnids, there are several fossil representatives in Tertiary and Secondary rocks, and such Paleozoic forms as *Behnurus* are probably also akin to it. Less closely connected are the fossil eurypterids and trilobites.

**King, Daughters of the**, a devotional guild for women in the Protestant Episcopal Church, founded in 1885. Its objects are the spread of the Christian religion among young women, and the strengthening of parish life.



Horseshoe-Crab—Under-Surface

**Kingfisher**, the name given to a large group of birds belonging to the family Alcedinidae. There are fully two hundred species and subspecies all remarkable for their brilliant coloring. In general they are of medium size, with compact bodies, short legs, short but powerful wings, large heads, and long stout bills. The feet are anadromous, the fourth toe being united to the third for more than half its length and the second united to the third at its base. The color is usually bluish or greenish above and chestnut or red variegated with black and white, below. The majority of the kingfishers live near the water, some feed principally upon fish which they capture alive while others subsist upon insects, reptiles, crustaceans and occasionally small birds.

**King George's War**, a war in America (1744-8) between England and her American colonies on one side and France and her American colonies on the other, in reality a part of the War of the Austrian Succession. The most important event of the war was the capture of Louisburg 1745 by New England and chiefly Mass troops. The place was, however, restored to France by the treaty of Aix-la-Chapelle, 1748. The war was marked by the usual border fighting in which Indians took part and was the next to the last of the series of



The British, after a gallant resistance, were defeated and compelled to surrender

**King-Snake**, the name of several N American harmless colubrine serpents, due to the belief, largely justified, that they seize and devour rattlesnakes and copperheads. The term is in special use in the South for the widely distributed mottled snake known in the North as the milk or house snake. The chain-snakes of the genus *Ophiobolus* are sometimes called king-snakes.

**Kingston**, city, capital of Jamaica and largest city of the British West Indies, is situated on the south side of the island. Its harbor admits the largest vessels. Four m s w is the naval station of Port Royal, the headquarters of the British naval forces in the West Indies. Old Port Royal, once the most flourishing English city of the New World, stood near the present naval station. In 1693 it was destroyed by a terrible earthquake.

On Jan 14, 1907, an earthquake destroyed practically all of the business portion of the city, and severely damaged the adjacent sections. Nearly all of the principal buildings collapsed, and most of the water front structures were demolished, and fire added to the destruction. Since that time the city has been to a large extent rebuilt, p 67,219.

**Kingston**, city, Ontario, Can, county seat of Frontenac co, is situated at the northeastern extremity of Lake Ontario, at the junction with the latter of the Rideau Canal system. It is strongly fortified and is an important port for the shipment of grain. It has a large dry dock, and its shipbuilding and boat interests are among the most extensive in Canada. On its site in 1673 an important French fort was built by Frontenac, who gave it his name. It came into the possession of the British in 1762, and after the Revolutionary War the name was changed to Kingston. It was the capital of Canada during 1841-44, p 21,753.

**Kingston**, city, New York, county seat of Ulster co, is picturesquely situated on the west shore of the Hudson River. A notable public building is the 'Senate House,' where the first sessions of the State legislature were held. Kingston, at first named Esopus, was settled in 1652 by the Dutch. It came into the possession of the British in 1664, and was given its present name five years later. It was incorporated as a city in 1872, p 28,599.

**Kingston-upon-Thames**, municipal borough, England, in Surrey. The old royal chapel, in which several of the Saxon kings were crowned, fell in 1730, but the coronation stone is preserved opposite the Court House. The

last encounter in the Civil War took place here in 1648, when Lord Francis Villiers was slain, p 39,484.

**Kingstown**, now **Dun Laoghaire**, town, Ireland, in County Dublin, 6 m s e of Dublin. The harbor, one of the finest in the United Kingdom, is protected by piers, enclosing an area of 250 acres, p 18,000.

**Kingstown**, seaport, St Vincent, West Indies, is beautifully situated at the head of a picturesque bay on the southwest coast, p 5,000.

**Kingsway**, the name of a thoroughfare in London which runs from a point on the southern side of High Holborn, opposite Southampton Row, in an almost straight line to Aldwych, the crescent which sweeps behind the Strand frontage from Wellington Street to near the Law Courts.

**Kingtechen**, town, China, in the province of Kiangsi, on the Peiho River, 86 m s e of Kiuiking. The city is entirely given over to the pottery industry. Estimated population about 300,000.

**King William's War**, a war (1689-97) in America between the English and the French and their Indian allies, in reality a part of the War of the League of Augsburg. On the French side the war was vigorously conducted by Count Frontenac, Governor of Canada, who in the winter of 1690 sent three expeditions against the New York, New Hampshire, and Maine frontiers, an English fleet under Sir William Phipps sailed up the St Lawrence in order to capture Quebec, whose fortifications, however, proved too strong for the assaults (1690), and there were the usual sanguinary border conflicts, in which both sides were assisted by the Indians. The war was terminated by the treaty of Ryswick. Consult Parkman's *Frontenac and New France under Louis XIV* (1877), Drake's *Border Wars of New England*, commonly called *King William's and Queen Anne's Wars*.

**Kinkajou**, (*Cercoptes Caudivolutus*), a small South American carnivore, related to the raccoons, but with a long prehensile tail.

**Kinkel**, Johann Gottfried (1815-82), German poet, was born in Oberkassel, near Bonn. He studied at Bonn University, where he became (1846) professor of poetry and art. He published (1846) a remarkably popular epic *Otto der Schutz*. For the part he took in the revolution of Baden (1849) he was arrested by the Prussians and imprisoned at Spandau, but with the aid of Carl Schurz escaped to England (1850), and later became a professor at Zürich. Of several works his best were *Mosais*

zur Kunstgeschichte (1876), and *Peter Paul Rubens* (1874)

**Kino**, a red exudate obtained by incision from the stem of *Pterocarpis marsupium*, a tropical tree of the order Leguminosae. Kino is largely used as an astringent, and also in the manufacture of red wines.

**Kinross-shire**, inland county of Scotland, between Perthshire and Invershire with an area of 87 sq. m. It is in open plain, surrounded by hills. A large percentage of it is cultivated, and much of it is adapted for cattle-rearing. The chief town is Kinross, p. 7454.

**Kintyre**, or **Cantire**, peninsular district Argyllshire, Scotland, 42 m. long, and from 4 to 11 m. broad. It is connected with the main land by the isthmus of Tarbat. The chief industries are fishing, farming, and stone-quarrying. The Mull of Kintyre, a promontory, at the southern end of Kintyre, is only 13 m. from the Irish coast.

**Kinzie**, John (1763-1828), American pioneer, was born in Quebec, Canada. The trading post on Lake Michigan that he established in 1804 was located on the present site of Chicago. He founded other posts in the West, but returned to Chicago, where he died. Consult *Kinzie's Wabash, or the Early Days in the Northwest* (1856).

**Kioto**, **Kyoto**, or **Saikyo**, city, Japan, in the province of Yamashiro, Honshu Island, 30 m. n.e. of Osaka. It is situated on the Kamo River, which divides it into two unequal parts. The city is one of the most interesting and picturesque of the cities of Japan. It has many magnificent temples, monuments and parks, and the streets are for the most part broad and clean. Features of interest are the Imperial Palace, the Imperial University, and the Daiributsu, or Great Buddha. The leading industries are the making of damascene ware, pottery, furniture, embroideries, silk weaving and dyeing, p. 1,177,000.

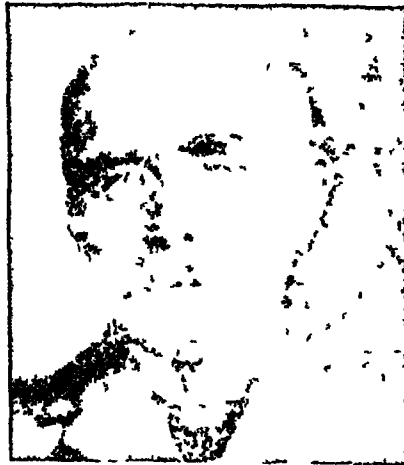
**Kioto** was founded in 793 by Kammu and was the capital of Japan from that date until 1868, when the court was removed to Tokyo.

**Kiowas**, North American Indians, whose origin at home appears to have been about the headwaters of the Platte River. Driven thence by the Cheyennes and Arapahoes, they occupied extensive tracts on the upper Arkansas, and here formed a permanent alliance with the neighboring Comanches. By the Medicine Creek treaty of 1867 both nations surrendered their hunting grounds, and were removed to the Kiowa, Comanche, and Wichita Reservation, Oklahoma.

**Kipchacks**, Mongolian tribe which about

the year 1230 were settled in Russia between the rivers Don and Ural. Their leader was Batu, a son of Jenghiz Khan, who fixed his golden tent near the Volga, from which the Kipchacks derived their name of the 'Golden Horde.' Under Batu's son, the tribe took Cracow, and adopting Islam, became allies of Constantinople and Egypt. Their power dwindled in the 14th century, although the 'White Horde' or Eastern Kipchacks continued to flourish, and captured Moscow in 1382. They were entirely routed by Timur (Tamerlane) in 1395, and in the 16th century their power came to an end.

**Kipling**, **Rudyard** (1865-1936), English novelist and poet, was born in Bombay, India, Dec. 30, 1865. In 1882 he went to India as sub-editor of the *Civil and Military Gazette*, where he remained until 1890. During these



Rudyard Kipling

years he wrote the stories afterwards published in volume form as *Plain Tales from the Hills*, *Soldiers Three*, *The Story of the Gadsbys*, *In Black and White*, *Under the Deodars*, *Wee Willie Winkie*, and *The Phantom Rickshaw*, and a volume of verses entitled *Departmental Disties*. Before returning to England at the close of 1889 he made a tour in China, Japan, and America, and it was not long after his return that he published his first long novel, *The Light that Failed* (1891). The next six years were spent partly in England and partly in travel in America, South Africa, Australia, and New Zealand. In the course of them he married (1892) Caroline Starr Balestier, with whose brother, Wolcott Balestier, he collaborated in a novel called *The Naulahka* (1893). His



other publications during this period were *Life's Handicap* (1891), *Barrack-room Ballads* (1892), *Many Inventions* (1893), *The Jungle Book* (1894), *The Second Jungle Book* (1895). Shortly after his return to England in 1896, he published a volume of poems, *The Seven Seas*. In 1897 he was specially elected to membership of the Athenæum Club and in 1907 he received the Nobel Prize for literature. In 1922 he was appointed Rector of the University of St Andrews. There has seldom been in the history of English literature a writer who has shown himself possessed of gifts so varied. His later work is, by most critics, considered inferior to that of his earlier years. Besides the works already mentioned his publications in-

*das Sonnenspektrum* (1962) was translated into English.

**Kirghiz**, or **Kirghiz-Kazaks**, a people of Turkish blood, with a strong Mongol element, spread over West Central Asia. They are divided into two main groups—Kirghiz-Kazaks and Kara-Kirghiz. The former inhabit the steppes of the Russian provinces of Ural, Turgai, Syr Daria, Akmolinsk, Semipalatinsk, and Semirechensk. They number about 2,747,000 and are a nomadic and patriarchal people. The Kara-Kirghiz, or Black Kirghiz, are found in the basin of Issyk-kul, in the Syr Daria province, in Fergana, on the Pamir plateau, in Kulja, and in East Turkestan. They are estimated at about 340,000.



Gate of Chion-In, one of the most famous Temples in Kyoto

clude *The Day's Work* (1898), *Stalky and Co* (1899), *Kim* (1901), *Just-So Stories* (1902), *The Five Nations* (1903), *Traffics and Discoveries* (1904), *Puck of Pook's Hill* (1906), *Actions and Reactions* (1909), *Rewards and Fairies* (1910), *A History of England* (with C R L Fletcher 1911), *The New Armies in Training* (1914), *France at War* (1915), *Fringes of the Fleet* (1915), *Sea Warfare* (1916), *The Years Between* (1918), *Inclusive Verse* (1919), *The Irish Guards in the Great War* (1923), *Limits and Renewals* (1931) etc.

**Kirchoff, Gustav Robert** (1824-87), German physicist, was born at Königsberg. In 1859-60, his researches on radiation led him to the definitive establishment of the science of spectrum analysis. His *Untersuchungen über*

**Kirin**, or **Girin**, a central province of Manchuria, with Korea and the province of Shingling on the s, area, 105,000 sq m. It is well watered and fertile, and produces pulse, millet, maize, wheat, barley, potatoes, and the poppy. Kirin is the capital, p. 5350,000.

**Kirjath-jearim**, a town on the northern border of Judah, Palestine, where the ark remained for some years. It was near Bethshemesh and e of the 'camp' or 'plun' of Dan.

**Kirkbride, Thomas Story** (1809-83), American physician, was born in Mornsville, Pa., of Quaker descent. He was superintendent of the Pennsylvania Hospital for the Insane, in Philadelphia, from 1840 until his death, and gained a wide reputation as an expert in the treatment of the insane, being the

first to insist on separate buildings for the sexes in psychopathic institutions. He published *The Construction, Organization, and General Management of Hospitals for the Insane* (1954).

**Kirkcaldy**, seaport and town, Scotland, on the southern coast of Fife, 10 m n of Edinburgh. The High Street is about four m long, hence the derivation of 'the long town o' Kirkcaldy'. Adam Smith, author of *The Wealth of Nations*, was a native, and here Thomas Carlyle and Edward Irving were school masters for some years, p 43,874

**Kirkcaldy**, or **Kirkaldy**, Sir William, of Grange (d 1573) Scottish soldier, who in 1546 took charge of the arrangements for the assassination of Cardinal Beaton. With Moray he took up arms against the Darnley marriage in 1565, and after the failure to rouse the country against it fled to England. Returning with Moray after Rizzio's assassination, he supported the Protestant lords against the queen on her marriage to Bothwell. It was to him she surrendered at Carberry, and it was mainly owing to his masterly generalship that she was defeated at Langside. He was on August 3, executed at the Cross of Edinburgh. See Grant's *Memoirs and Adventures of Sir William Kirkcaldy of Grange* (1540), and Barbe's *Kirkcaldy of Grange* (Famous Scots Series).

**Kirkcudbrightshire**, or the Stewartry of Kirkcudbright, maritime co., Scot'nd, skirting the n shore of the Solway Firth for some 50 m. The coast is irregular and rocky, and contains numerous coves, in former times the storehouses of smugglers (see *Guy Mannering*). Only 33 per cent of the area is under cultivation, the grassy uplands being more suited to the rearing of sheep and Galloway cattle. The chief town is Kirkcudbright Area, 989 sq m, p 30,341

**Kirkdale Cave**, limestone cavern, N Riding, Yorkshire, England, owes its fame to the discovery, in 1821, of fossil remains of mammals now extinct in Great Britain.

**Kirke**, Sir David (1596-1656), English adventurer, who effected the first English conquest of Canada, born at Dieppe, France. In 1629, war having broken out (1628) between England and France, he and his two brothers, in command of a small fleet fitted out by his father for the conquest of Canada, forced the surrender of Quebec, then under Champlain, the stronghold, however, was soon returned by Charles I to France. See Henry Kirke's *The First English Conquest of Canada* (1871).

**Kirke**, Percy (?1646-91), English soldier, colonel of 'Kirke's Lambs,' served under Mon-

mouth, and was appointed to command at Tangier (1685). The regimental symbol, 'the Paschal Lamb,' provided the above nickname for his men, who, after Sedgemoor and Monmouth's defeat (1685) became a synonym for ferocity because of the treatment of the rebels. Kirke helped William III against James, and raised the siege of Derry.

**Kirkland**, Samuel (1741-1808), American missionary and educator. He worked among the Indians in the neighborhood of Oneida, N.Y., for the greater part of his life. He was able during the Revolution to secure the neutrality of the Oneida Indians, and after the war labored for the civilization of the Indians generally. Hamilton Oneida College, now Hamilton College, was founded by him in 1793.

**Kirkville**, city, Adair co., Mo. Extensive bituminous coal mines are in the vicinity. Kirkville is the chief centre of osteopathy in the U.S. and the seat of the American School of Osteopathy and an osteopathic hospital. It was settled about 1828 and incorporated as a city in 1892, p 10,080



Lord Kitchener of Khartoum

**Kirkwood**, Daniel (1814-95), American astronomer, was born in Maryland. He published (1867-88) *Comets and Meteors*, and *The Asteroids*. He anticipated, in 1861, the relationship between comets and meteors established in 1866, criticised effectively Hipparchus's nebular hypothesis, and explained the lacunae

in the distribution of asteroidal orbits, and in Saturn's ring system, by the commensurability of the periods of the missing bodies with those respectively of Jupiter's and Saturn's satellites.

**Kirkwood, Samuel Jordan** (1813-94), American political leader, the 'war governor' of Iowa, born in Harford co., Md. He was elected to the Iowa senate (1856), was governor of Iowa (1860-4 and 1876-7, vigorously supporting President Lincoln during the Civil War, was a Republican member of the U. S. Senate (1866-7 and 1877-81), and was secretary of the interior under Presidents Garfield and Arthur (1881-2).

**Kirmanshah** See **Kermanshah**

**Kirschwasser**, a cordial prepared from both the fruit pulp and the stones of ripe cherries.

**Kisfaludy, Károly** (1788-1831), Hungarian dramatist, born at Tet, co. Ráb. He is regarded as the founder of the national theatre. His best works are *The Tartars in Hungary* (1814) and *The Student Matthias*.

**Kishinev**, cap. of Bessarabia, U. S. S. R. The high or new city stands on a hill 740 ft. above sea-level, the low town, or old Kishinev, lies on the river bank of the Byk, an affluent of the Dniester. Brandy, leather, soap, candles, and woollen stuffs are made here. Massacres of the Hebrew community took place here in 1904, and again in 1905. Pushkin, the Russian poet, resided in the city from 1820-1823, p. 114,445.

**Kishon**, the river of Central Palestine by which Sisei was defeated, and the prophets of Baal were destroyed by Elijah.

**Kiska**, an island of the Aleutians, Alaska, seized by the Japanese in 1942, and recaptured by U. S. forces in the summer of 1943.

**Kismet** (Pers. *kusmut*, Ar. *kismeh*), a word used by Mohammedans for 'fate' or 'destiny'. One of the leading precepts of Mohammed was that the decree of God must be submitted to by the faithful with absolute resignation. See **MOHAMMEDANISM**.

**Kissing**, a custom peculiar to Caucasians, and unknown to yellow and black races, originated in a maternal cross, and developed into the expression of affection, friendship, reverence, and love, according to Professor Lombroso. From the Roman custom of greeting friends by kissing arose the kiss of peace, as a symbol of Christian brotherhood.

**Kistna**, or **Krishna** (1) River of S. India, rises in the W. Ghats at an altitude of 4,500 ft., flows s.e., and breaking through the E. Ghats empties itself by two main outlets into the Bay of Bengal, after a course of 800 m. (2) District on the coast of the Madras Presidency,

India, with area of 84,715 sq. m. and a population of 2,154,803. Masulipatam is the capital.

**Kit**, of a soldier, a collective term signifying such articles as underclothing, towels, boots, brushes, and not applying to uniform, arms, etc. The U. S. army kit or pack is in the form of a blanket roll. Each man carries a number of articles, having a total weight of about 62 pounds, not including the rifle.

**Kit-Cat Club**, a society formed in London, England, about 1700, whose object was the encouragement of literature and the fine arts. The club derived its name from meeting in the house of Christopher Catt, a pastry cook.

**Kitchen Cabinet**, in United States history, a name applied to some of President Jackson's intimate friends, who were believed to have more influence over him than his regular advisers. The term has since been applied to other groups of men who have been believed to exert a similar influence over later presidents.

**Kitchener**, formerly Berlin, city and customs port, Ontario, Canada, county seat of Waterloo co. Power transmitted from Niagara Falls, more than 100 m. distant, is employed in the manufacture of furniture, rubber, leather, felt goods and products, shirts, buttons, beet sugar, clocks, biscuits, candy, glass, baggage, clothing, woodenware, pianos, forges, ventilators, and fans, p. 30,793.

**Kitchener of Khartum, Horatio Herbert, Earl** (1850-1916), British soldier and administrator, was born at Croft House, Ballylongford, Ireland, second son of Lieut.-Col. Henry Horatio Kitchener of Leicestershire and Anne Frances Chevalier of Aspell Hall, Suffolk. He was educated in France and in the Royal Military Academy at Woolwich, which he entered in 1868. In 1870, while on a visit to France, he served in the Second Army of the Loire, and participated in the retreat of the French forces after the disastrous battle at Le Mans. He completed his course at Woolwich, and in 1871 received a commission in the Royal Engineers. He was engaged on the Palestine survey from 1874 to 1878, and on the Cyprus survey from 1878 to 1882.

In 1882 Kitchener was appointed to a river command in the Egyptian army. He received the rank of colonel in the British army in 1888, and became adjutant-general of the Egyptian forces. He completed the reorganization of the khedive's forces and organized the Dongola Expeditionary Force. In recognition of this service he was advanced to the rank of major-general and created K.C.B. The next two years were devoted to completing the work so auspiciously begun. The Sudan Military

Railway was constructed under his direction, on April 8 1865, he defeated the Mahdist forces on the River Atbara, on Sept. 2 he won the great victory at Omdurman, and two days later entered Khartum. For these signal accomplishments he was raised to the peerage as Baron Kitchener of Khartum and received a formal resolution of thanks and a grant of \$150,000 from the British Parliament. During a flying visit to England he raised \$500,000 for the foundation of a college at Khartum in memory of General Gordon.

Upon the outbreak of the South African War (1900), Kitchener was made chief of staff to Lord Roberts, whom he later succeeded as first in command of the South African forces. He demoralized the organized guerrilla warfare of the Boers by a system of block houses and extensive drives, and eventually brought the war to a successful conclusion. Upon his return to England he was appointed commander-in-chief in India (1902), where he remained for seven years, completely reorganizing the service. He was promoted to the rank of field marshal in 1900, and was named to succeed the Duke of Connaught as commander of the Mediterranean forces. He made a brief visit to America in 1910, and in 1911 returned to Egypt as British consul general and agent. In 1914 he was made an earl.

At the opening of the First World War in 1914, Lord Kitchener was appointed Secretary of State for War, a position which he retained in Asquith's coalition Cabinet of 1915. He immediately set about the enormous task of raising a British army for the war, and in less than eighteen months organized and equipped 5,000,000 troops. He was sent successively to France, to Gallipoli, and the Near East, rendering important services. He was drowned while on his way to Russia, on June 5, 1916, when the cruiser *Hampshire* was sunk off the Orkney Islands.

**Kitchen Middens, Kitchen Mounds, Shell Mounds,** are terms used by archaeologists to denote the domestic refuse heaps of certain primitive races. These heaps, containing rude implements of bone and wood, fragments of pottery and broken animal bones—presumably the *debris* from daily meals—may belong to any period of man's history, and need not denote a prolonged residence in their neighborhood of the race who reared them. The formation of such kitchen middens is still going on among primitive peoples—notably among the Eskimos.

Kitchen middens are numerous in America,

from Alaska to Tierra del Fuego, both on the Pacific and the Atlantic Coast, and even inland on the shores of large streams. Special excavations have been made in the larger mounds of Georgia, Florida, Long Island, British Columbia and Alaska.

**Kite,** a term which, though strictly applicable only to the rare European Red Kite (*Ursus ichnus*), is generally applied to a group of birds of prey distinguished from the buzzards by the long forked tail, elongated wings, short metatarsus and toes, and claws of only moderate length. In America, four allied species called *hites* occur in the warmer parts of the United States, but their habits are more like those of ordinary hawks.

**Kite.** The first use of kites for scientific purposes was probably in 1740, when Dr. Alexander Wilson and Thomas Melville raised into the clouds thermometers attached to kites. Benjamin Franklin's famous experiment of collecting the electricity of a thunder cloud by means of a kite was performed three years later at Philadelphia. Modern scientific kite flying may be said to date from 1883, when Douglas Archibald, in England, fastened anemometers to the kite wire, and so registered the wind movement at various elevations up to 1,200 ft.

The general results of over two hundred records from kites flown at Blue Hill Observatory have been summarized in several communications to scientific journals. The great practical importance of kite records in the United States lies in the information which they give of coming weather changes which are first felt in the upper air. To facilitate weather forecasts, the United States Weather Bureau has equipped a number of observing stations with kite appliances. A recent development of kites has been the multicellular tetrahedral kite of Prof. Alex. Graham Bell, which has shown great lifting power.

Military kites are chiefly of two kinds. A small one is used to carry a camera for photographing a fort or intrenched lines from above, the shutter being worked by electric wire or by clockwork. A larger kite, or preferably several kites coupled together, are used to lift a man up to, say, from 50 to 100 ft. or more for purposes of reconnoitering.

**Kat Kat Club,** a society in N. Y. city, named after the famous Kat-Cat Club of London, composed of painters and illustrators.

**Kittatinny,** or Blue Mountains, in New York, New Jersey, and Pennsylvania, part of the Appalachian system, is a ridge from 1,200

to 1,800 ft in height, and is noted for beautiful scenery, including the famous Delaware Water Gap

#### Kittatinny, or Cretaceous Peneplain

At least three times in early geologic history the Appalachian region was the seat of great dynamic changes. Each time the strata were subjected to folding, and mountain ranges probably comparing favorably with the Alps in ruggedness were developed. But beginning with the Mesozoic, an extremely long era of continental stability was inaugurated, during which time the processes of erosion succeeded in planing off the folds and reducing all sorts of inequalities to near base level. That ancient plain, at nearly sea-level in its maturity, was subsequently elevated by general continental uplift several hundred feet, by which the streams were rejuvenated and began to carve valleys anew. The truncated folds were discovered beneath the alluvium, the softer strata were readily attacked, and gradually by different erosion great and deep valleys were sunk into the old plain. Because of the numerous remnants of this old plain still existing as crests in the Kittatinny Range, this former almost obliterated form, a relic of a former erosion cycle, is known as the *Kittatinny Peneplain*.

**Kittery**, village, York co., Me., opposite Portsmouth. There is a U S navy-yard here, commonly called the Portsmouth Navy-yard. It became celebrated in connection with the treaty of Portsmouth, concluding peace between Japan and Russia, p. 5374.

**Kittredge, George Lyman** (1860-1941), Am. philologist and literary scholar, born in Boston, after grad. at Harvard, served as English instructor there 1888-90, asst. professor 1890-94, professor from 1894, was author of standard versions of Chaucer, Shakespeare, English ballads and early Anglo-Saxon language.

**Kitty Hawk**, village, Currituck co., N. C., on the Atlantic coast. Here the first successful flight of an airplane was made, Dec. 17, 1903.

**Kiungchow**, treaty port and chief city of Hainan, China,  $3\frac{1}{2}$  m. from its port Hoihow, exports sugar, sesamum, grass-cloth, pigs, poultry, p. 35,000.

**Kiushiu**, or **Kimo**, the most southerly of the four large islands of Japan proper, separated from Korea by the Strait of Korea, and from Nippon or Honshu by Shimonoseki Strait and part of the Inland Sea. The chief harbor is Nagasaki, p. 8,524,953.

**Kiwanis International**, a fraternity of business and professional men which originated

in Detroit, Mich., in 1914. The title was adopted from an Indian word meaning 'to make one's self known' or 'to impress one's self'. It is based upon the principle of service, capitalizing for constructive service groups of men who eat together once a week. It develops friendship and encourages leadership, seeks to build better communities through intelligent and unselfish loyalty. The first club was chartered Jan. 21, 1915, in Detroit. There are 29 geographical districts in the United States, each with a governor. At the close of the year 1940, there were in this international organization 2000 clubs, with a membership of approximately 110,000. The organization has many activities including work among under-privileged children, safety and health projects, vocational guidance, support of churches, charitable enterprises, citizenship, and the supervision and development of recreation.

**Kızıl İrmak**, or **Halys**, the largest river in Asia Minor, rises in the Karabulagh, from 70 to 80 m. e. of the town of Sivas.

**Kızıl-kum**, desert tract of Russian Central Asia, stretching between the Amu Darya and Syr Darya, and between the Aral Sea and the Kara-tau highlands.

**Klamath**, river, California, flows through the Klamath Lakes in S. Oregon, and after a circuitous course through the Cascade and Coast ranges, which it pierces in canyons. Its length is 270 m., and its drainage basin embraces 14,660 sq. m.

**Klamath Falls**, city, county seat of Klamath co., Oregon, on the Upper Klamath Lake.

**Klein, Bruno Oscar** (1858-1911), German-American composer, born at Osnabrück, Germany, and studied music under his father and at the Munich Royal Music School. He came to the U. S., 1878. His opera, *Kentworth*, was produced at Hamburg, Germany, 1895.

**Klein, Charles** (1867-1915), Am. dramatist, born in London. His most successful plays: *The Auctioneer* (1901), *The Music Master* (1904), *The Lion and the Mouse* (1905), *Maggie Pepper* (1911).

**Klein, Felix** (1849-1925), German mathematician. He was appointed at Göttingen in 1886, and commissioned by the Prussian government to attend the conference at Chicago in 1893. His mathematical works have been much in use among American students.

**Kleist, Ewald Christian von** (1715-59), German poet, served under Frederick the Great, and was mortally wounded at Kunersdorf.

**Kleist, Heinrich von** (1777-1811), German dramatist of the romantic school

**Kleptomania** is a manifestation of insanity, in which the patient is possessed by an irresistible impulse to steal

**Kleve, or Cleves**, town, Prussian prov of Rhineland Henry VIII of England married (1539) Anne, daughter of John, Duke of Cleves

**Klinger, Friedrich Maximilian von** (1752-1831), German poet and playwright His drama, *Sturm und Drang* (1776) gave the name to the exuberantly-romantic school to which he belonged He is best known by his novel, *Der Woldemar und der Dichter* (1798), and the plays *Conradin* and *Medea* See Riegen's *Klinger in der Sturm-und Drang-Periode*

**Klinger, Max** (1857-1920), German painter and sculptor His work is original and bizarre As a painter, his most noted work is *The Judgment of Paris* (1888), now in the Vienna Gallery

**Klipspringer, or Kainsi**, a small but very active antelope (*Oreotragus saltator*), found in the rocky regions of South Africa from the Cape to Abyssinia

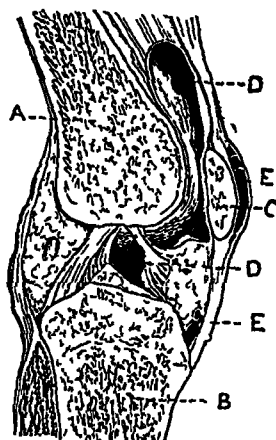
**Klopsch, Louis** (1852-1910), German-American journalist and philanthropist, was born in Germany, and was educated in the New York City public schools After a period of journalistic work (1877-90), he became proprietor of *The Christian Herald*, in 1902, and thereafter carried on his vast charitable works through the medium of that paper He founded the Bowery Mission, and conducted a summer home for tenement-house children near Nyack, N Y While on a tour around the world he was received in audience by the rulers of England, Russia, Italy, Sweden, and Denmark He was decorated by the Emperor of Japan with the Order of the Rising Sun

**Klopstock, Friedrich Gottlieb** (1724-1803), German poet, was born in Quedlinburg He was a pupil at Schulpforta (1739-45), and there conceived the idea of writing a great religious epic The first three cantos of his *Messias* were published in 1748 The twenty cantos of the *Messias* were not completed till 1773

**Knaus, Ludwig** (1829-1910), German genre painter, was born in Wiesbaden He was professor at the Berlin Academy from 1874 to 1884 Among his best-known pictures are *Children's Feast* (1869), in the National Gallery, Berlin, and *None but the Cats*, in the Metropolitan Museum, New York

**Knee** The knee is a hinge-joint, and the bones entering into its formation are the lower

end of the femur, the upper end of the tibia, and the posterior surface of the patella, or knee-cap The synovial membrane of the knee is the largest in the body The chief movement at the knee is that of flexion and extension, but slight rotation is also possible



Section of the Knee

A, Femur, B, tibia, C, patella, DD, synovial sac, EE, bursae

The chief affections to which the knee-joint is liable are sprain or rupture of ligaments, synovitis, fracture of the patella, displacement of semilunar cartilages, and tubercular disease As in other joints, rest plays a leading part in the treatment of disease or injury of the knee Patients whose occupation compels them to kneel much are liable to an inflammation of the bursa over the patella The condition is often called 'housemaid's knee' When the semilunar cartilages become movable, they produce the same symptoms as other loose bodies in a joint 'Locking' of the knee in one position is a frequent symptom

**Kneeland, Samuel** (1821-86), American naturalist He practised medicine in Boston, served as a surgeon in the Civil War, and in the zoological department of the Massachusetts Institute of Technology He made special investigations as to earthquakes and volcanoes in Iceland, the Hawaiian Islands, and elsewhere Besides much editorial and encyclopædia work, he published *An American in Ireland* (1876)

**Kneeling**, a sign of reverence, the usual attitude of Christians during prayer and at other parts of the church services Among the ancient Hebrews, the attitude of prayer was usually standing with outstretched arms, ex-

cept in the case of petitions of special solemnity and importance, such as those of penitents. Among the early Christians, kneeling became common through the week, but except as a penance, was done on Sundays only, during the penitential Lenten season, standing being regarded as the attitude of praise and thanksgiving. Kneeling, however, grew to be a necessary part of the church ritual, and was intimately associated with the Eucharistic controversy between the Puritan and Catholic parties in the Church of England.

**Kneisel, Franz** (1865-1926), German-American musician, came to the United States in 1885 as first violin of the Boston Symphony Orchestra, of which he also became concertmaster. The next year he organized the well-known 'Kneisel Quartette.'

**Kneller, Sir Godfrey** (1646-1723), portrait painter, was born in Lubeck, Germany. He was a pupil of Rembrandt and Ferdinand Bol at Amsterdam. His real career began after he came to London (1675) and was introduced (1678) to the court of Charles II. He painted many people of distinction.

**Knickerbocker**, name applied to descendants of Dutch settlers of New York. Made popular through Washington Irving's *Knickerbocker's History of New York* (1809).

**Knickerbocker Village**, a model housing development in New York City, built with the aid of a loan from the Federal Govt.

**Knight, Charles** (1791-1873), English author and publisher. For the Society for the Diffusion of Useful Knowledge he issued the *Penny Magazine* (1832-45), the *Penny Cyclopaedia* (1833-44), and the *English Cyclopaedia* (1853-61). His *Pictorial Shakespeare* (1838-41) introduced the dramatist to new circles of readers. Knight's other publications include *Library of Entertaining Knowledge*, *Pictorial Bible*, *Pictorial History of England*, and *Popular History of England* (1856-62).

**Knight, Charles Robert** (1874- ), American painter, was born in Brooklyn, N. Y. His specialty is the painting of animals and birds, which he has done not only for magazines and books, but with a naturalist's accuracy for museums, among them the U. S. Govt., the Carnegie, the Los Angeles, and the Field Museum, Chicago. He is best known for his series of large mural paintings of prehistoric men and animals and his habitat groups at the American Museum of Natural History.

**Knight, Daniel Ridgway** (1850-1924), American painter, born in Philadelphia. He established his studio at Poissy, not far from Paris. His pictures mainly of the peasant girls

and the beautiful landscape of the neighborhood of Poissy, possess a charm and a delicacy of color and sentiment that have made them very popular. Among the best known are *Washerwomen* (1875), *Chatterboxes* (1885), *En Octobre* (1887), *Summer Evening* (1898), *Quetude* (1900).

**Knight, Richard Payne** (1750-1824), English archaeologist and numismatist, and classical scholar, who bequeathed his collection of coins, medals, pictures, prints, and drawings, valued at \$250,000, to the British Museum.

**Knight, Sarah** (1666-1727), American diarist, was born in Boston, Mass., and was the daughter of Thomas Kemble, a Boston merchant. Among the pupils in her school was Benjamin Franklin. The shrewd humor of her mind is manifested in *The Journals of Madam Knight* (1825), containing the happy description of her journey on horseback from Boston to New York in 1704.

**Knighthood**. A feudal institution involving personal and military service to noble and king. Closely connected with knighthood is chivalry, which may be said to represent the atmosphere which surrounded the medieval knight. The religious character of the investment of a knight, the respect paid to women, the development of the idea of honor, all formed part of that chivalry which was closely bound up with the order of knighthood. The knight's fee was subject to certain feudal rights, incidents, and services, and both in England and on the Continent there were various grades of knighthood. In the Tudor period civilians frequently received the honor of knighthood, and in more modern times men who have distinguished themselves in almost any civil calling are knighted. The decay or knighthood as a purely military institution was rapid from the end of the 14th century. Tennyson, by his poems upon King Arthur's Round Table, has in our own day thrown a halo of romance around the knights who were associated with the king in warfare or in the search for the Holy Grail. There is no doubt that the system of knighthood, owing to its close connection with religion, proved a valuable civilizing force in the middle ages, when feudalism was rampant, and the position of European monarchs by no means firmly established. See Freeman's *Norman Conquest* (3d ed. 1877).

**Knights of Columbus**. A fraternal or organization of Roman Catholic men, founded in 1882 under a charter from the Connecticut General Assembly which defines its business as that of a fraternal benefit society and its aims

as the promotion of educational, charitable, religious, and social welfare work. Its four principles are charity, unity, fraternity, and patriotism. The order is governed by a supreme council, under which work State councils and 2,464 subordinate councils. The total membership numbers about 575,245. During its 50 and more years of service it has paid out more than 50 million dollars in member benefits. Headquarters, New Haven, Conn.

**Knights of Labor**, a general labor organization in the United States, comprising all classes and conditions of workmen. It was founded in Philadelphia in 1869 by Uriah H. Stevens, a garment cutter, and was originally designed to educate the laboring classes so that through a system of co-operation the wages system might be finally abolished. In 1878 the total membership did not exceed 10,000. In 1887 it approximated 800,000. In 1893 the membership had declined to 40,000. The Knights of Labor was the first workmen's organization to admit employers, women and unskilled laborers.

**Knights of Pythias**, a charitable and benevolent secret society, formed at Washington, D. C., in February, 1864, by Justus H. Rathbone and associates, most of them government department clerks. In one section of the fraternity, the Endowment Rank, to which admission is optional, it insures the lives of members on the mutual assessment plan. The total membership, in about 5,000 lodges, is about 300,000. Women relatives of Knights of Pythias have formed themselves into organizations known as the Rathbone Sisters and the Pythian Sisterhood. See **SECRET SOCIETIES IN THE UNITED STATES**.

**Knights of Rhodes and Malta**. See **Hospitallers**.

**Knights of St. John of Jerusalem**. See **Hospitallers**.

**Knights of the Golden Circle**, a secret society which existed in the Middle West during the Civil War, and which in 1863 became the Order of American Knights and in 1864 the Sons of Liberty, the original name being taken from that of a secret society in the Southern States before the war, the members of which advocated a separation of the two sections. See vol. v of Rhodes, *History of the United States from the Compromise of 1850* (1904), Nicolay and Hay, *Abraham Lincoln*, vol. viii, (1890).

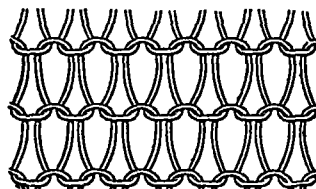
**Knights Templars**. See **Templars**.

**Knitting**, the forming of a looped web or

fabric, may be done (1) by hand, (2) on a frame.

(1) **Hand knitting** has for appliances two or more straight needles of wood or iron, the fabric being, by the aid of these, made up from one continuous thread. A series of loops is formed successively on each needle by passing the thread round a pin and drawing it through the previously-made loop. Each stitch so worked is then slipped off and left hanging free. The first row being completed, a second row is worked below it in a similar manner, and so on to any length. If two needles only are used, the fabric formed will have a selvage or edge on each side, if three needles, a continuous circular web, as of a stocking, may be knitted. Variations in width to any extent may be obtained by increasing or decreasing the number of stitches in a row, and alternations in design may be effected by looping the thread in different ways or by the introduction of threads of various colors.

(2) **Framework knitting** was introduced about the year 1589 by William Lee of Nottinghamshire, the mechanical principles of whose invention remain almost unaltered to



*Arrangement of Loops in Ordinary Web made on Hand-frame*

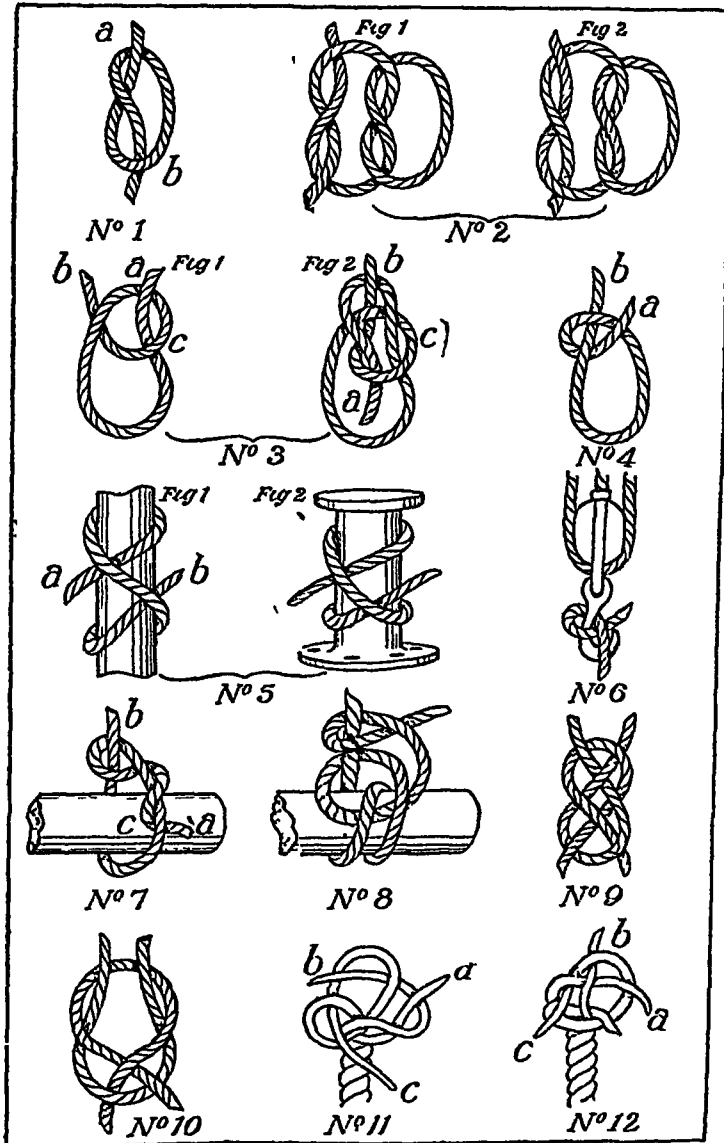
the present day. By providing, in the 'hand stocking frame,' a needle for each loop, so that all the loops in one row were formed simultaneously, the speed of knitting was increased from 100 stitches per minute by hand to 600 stitches per minute on the frame. The first fabric thus produced was a flat piece, circular work not being accomplished until later. Rib work was the first variation from a plain fabric, and was produced on a hand frame by the addition of a rib machine invented by Strutt about 1758.

The first great variation in framework knitting was made by the adoption of 'warp' threads, one to each needle, instead of the one thread to each row, as in the former (plain-knitting) methods. The warp threads are laid alternately on the needles to right and left, thus forming a series of loops without the intervention of sinkers, which are dispensed with



altogether The first stocking-frame was driven by steam power in 1828, and from that date the hand stocking-frame and hand-warp frame were gradually superseded by the rotary frames and looms the machines of to-day About 1830 a French inventor introduced a machine for circular knitting by means of a

bladed sinker wheels A machine on this principle is still known as the English loop-wheel circular frame A still greater improvement was the adoption, in 1848, of a self-acting or 'latch' needle, which formed a loop without the aid of sinkers and pressers indispensable to the bearded needle. The latch



Common Knots

series of bearded needles radiating outwards from a revolving ring, the loops being formed by sinkers which also revolve. Ten years later a machine was introduced in Nottingham which performed similar work, but of smaller diameter, by means of vertical needles and

needle has a hook which is closed automatically by a latch at one part of the stroke, so that the new loop may be passed through the old one, and is then opened for the former loop to be freed and another admitted. About 1870 an automatic machine called the Griswold

knitter, was introduced, which was of the latch needle type, but differed from the older latch needle circular frame in having the needles stationary, and in being worked by revolving cams.

**Knot** (*Tringa canutus*), a shorebird which winters on both coasts of the Atlantic in considerable numbers. It is found practically over the whole world, but breeds only in the far north—probably in N. Greenland and Arctic America. In the winter plumage, when sought by gunners, the bird is ash gray above and white flecked with gray below, but when breeding the under surface is largely chestnut, and the back red-brown with black-and-white markings.

**Knot**, the conventional nautical mile, is assumed to be 6,080 ft. A statute mile is 5,280 ft. For navigating purposes, a mile of latitude and a minute of latitude are considered to be of equal value. Consequently the nautical mile is the length of a minute of the meridian, and, strictly speaking, is different for every latitude. In the United States the sea mile is calculated at 6,082.66 ft. For charting and other purposes 10 cables make one knot, though a cable, as a measure of distance, is generally assumed to be 600 ft. A knot is so called from the fact of knots being made in the log-line, which is used to ascertain the rate at which a ship is progressing through the water. See LOG, NAVIGATION.

**Knot** (in cordage). Scientifically defined, a knot is an endless physical line which cannot be deformed into a circle. For practical purposes a knot is either (a) a knob at the end of a piece of rope, made with or without involving the strands of it, or (b) a method of arranging a rope for making it fast to another, or to some object, such as a ring or a spar. Among the usual knots are the following:—

'Overhand knot,' (The commonest kind of a knot, made by passing one end of a line over the line and round it, and then passing it through the loop), 'Reef knot,' 'Bowling knot,' 'Half-hitch,' 'Clove hitch,' (This is a knot that is very useful and safe), 'Blackwall hitch,' 'Timber hitch,' 'Fisherman's bend,' 'Carrick bend,' 'Sheet bend,' 'Single wall knot,' (This knot is for the purpose of forming a stopper, and to prevent the end of the rope from coming apart). Many other knots are used in seamanship.

**Knott, James Proctor** (1830-1911), American lawyer and political leader, born near Lebanon, Ky. He removed to Mo. (1850), was a member of the lower house of the Mo. legislature (1858-9), and was attorney-general

of the State (1859-61). He then returned to Ky., was a prominent Democratic representative in Congress (1867-71 and 1877-83), was governor of Ky. (1883-7), was a member of the Ky. constitutional convention of 1891, and was professor of civics and economics (1892-4) and professor of law and dean of the law faculty (1894-1901) of Centre College, Danville, Ky.

**Knout**, a thong of leather, triangular in shape, and very long, with which people were flogged upon the back in Russia. It was sanctioned by the father of Peter the Great, and was abolished by Czar Nicholas I.

**Knowles, Lucius James** (1818-84), American inventor born at Hardwick, Mass. He established a small machine shop in his store, and there carried out his experiments, and



*John Knox*

*Portrait by Hondius, rejected by Carlyle, but now generally accepted as genuine*

finally devised workable thread making machinery. He invented apparatus which enabled him to start a factory for making cotton warps at Spencer, Mass., in 1847. In 1858 and subsequent years he turned his attention to the manufacture of steam pumping machines and tape-binding looms invented by himself.

**Knowlton, Frank Hall** (1860-1926), Amer. botanist. He joined the staff of the U

S National Museum, 1884, and in 1900 was appointed palæontologist of the U S Geological Survey. In addition to his botanical editorship of several dictionaries and encyclopædias, he published a number of palæontological works.

**Know-nothing Party**, more properly the **Native American**, or **American Party**, a party first organized in the United States in 1852, originally a secret association, whose members, refusing to give information about the organization and disclaiming all knowledge concerning it, were popularly called 'Know-nothings'. Their object was to secure the government to those whom they considered genuine Americans, their fundamental doctrine being 'Americans should rule America'. Roman Catholics and recent immigrants they regarded with distrust and hostility, and they advocated extending the period required for naturalization to 21 years. In 1856 the party participated in the national campaign, but its candidates for the presidency and the vice-presidency, Millard Fillmore and A J Donelson, received the electoral votes (8) of only one state, Maryland, though they received a popular vote of 874,524. After this election, the party rapidly disintegrated.

**Knox, (William) Franklin** (1874-1944), American publisher, was born in Boston, educated at Alma College. After editing various newspapers, he became publisher of the *Chicago Daily News*, 1931, Rep nominee for Vice President, 1936, Sec of Navy, 1940-44.

**Knox, Henry** (1750-1806), American soldier, born in Boston, Mass., where for many years he was a bookseller. In the pre-Revolutionary controversies between the colonists and the British government, his sympathies were strongly with the colonists, and during the Revolution he was a conspicuous officer on the American side, taking a prominent part in Washington's campaigns. In May, 1783, he was instrumental in founding the Society of the Cincinnati, on Aug. 25, 1783, he received from Sir Guy Carleton the surrender of New York City, and from Dec., 1783, to June, 1784, he was commander-in-chief of the U S army. He was secretary of war under the confederation government (1785-9), and, after the organization of the national government, was the first secretary of war, in the cabinet of President Washington (1789-94), the navy being also under his jurisdiction.

**Knox, John** (1513-72), Scottish reformer, the son of William Knox, a feudal dependent of the earls of Bothwell. Formerly he was supposed to have been born in 1505, but later

opinion favors 1513. While in 1546, acting as tutor to the sons of Douglas of Longniddry and Cockburn of Ormiston, he came under the influence of the reformer Wishart. Later, at the urgent request of certain leading reformers, he was induced, after great hesitation, to take upon him the vocation of preacher in the parish church of St Andrews. In 1549, he went to London. In 1552 he was invited to preach before the court in London and his sermon had considerable effect in modifying the rubric on kneeling at communion. On the accession of Mary Tudor, he returned to the north, and finally, in January, 1554, set sail for Dieppe. While there he sent to England a printed 'Godly Letter to the Faithful in London, Newcastle, and Berwick'. From Dieppe he proceeded to Geneva, where he met Calvin, and afterwards to Zurich, to consult Bullinger as to the attitude of Protestant subjects to Catholic sovereigns. He there took part in organizing an English congregation, but having received such favorable news of the progress of Protestantism in Scotland, he resolved to journey to Edinburgh. His visit was specially opportune, for the Catholic policy of the queen-regent had become so identified with the ambitious aims of France, that many of the leading nobles and barons were, even on grounds of patriotism, becoming more and more favorably disposed towards Protestantism. Knox made the most of this turn of good fortune, and before the alarm caused by his success compelled him in July, 1556, again to leave Scotland, he had practically given to Protestantism an impetus that almost ensured its final triumph. Returning to Geneva, he, with the exception of a few months at Dieppe in 1557, remained there as joint-pastor with Goodman of the English congregation until his final return to Scotland in January, 1559. During his residence at Geneva he came more entirely under the influence of Calvin—a fact which had permanent effect in shaping the character of Scottish Protestantism, as regards both doctrine and church government. On his arrival in Scotland he found the reformers in active resistance to the Queen-regent, and by his remarkable sermons he greatly strengthened the Protestant enthusiasm. When, at the most desperate crisis of the struggle, everything seemed going against the reformers, it was his confidence mainly that nerved them to resistance until Elizabeth was induced to send them such aid in men and money as to force the queen-regent to an agreement freeing Scotland from the French soldiers. The victory now remaining with the

reformers, Knox, under the new regime became minister of Edinburgh (1560). The death of the queen regent was a further blow to Roman Catholicism and before the arrival of Mary Stuart in Scotland in 1561, Protestantism was formally installed as the established religion of the country. His distrust of the Protestant leaders Moray and Methuen was increased after each of the famous interviews with the queen which he has so graphically described. The Darnley marriage was the first step towards both her ruin and the hopeless overthrow of Roman Catholicism. Her association with Rizzio was the second step downwards. Whether Knox had full knowledge of the Rizzio conspiracy or not, he fully approved of the murder, and after the escape of the queen to Dunbar he deemed it prudent to 'press west to Kyle'. In December following he also obtained leave from the assembly to go on a special mission to England, but after the murder of Darnley he returned, and did his utmost to rouse the nation against the queen and Bothwell. Henceforth he and Moray acted in concert, and the success of Protestantism was fully assured. Knox's work was now practically done, his physical strength had been for some time on the wane, but he continued to manifest all his old oratorical energy. In August, 1572, he returned to Edinburgh, where, after being carried to the pulpit, he continued to address audiences—the occurrence of the massacre of Bartholomew, in September, supplying an admirable theme for his denunciatory eloquence. He died on Nov. 24, 1572.

Neither the character nor the work of Knox can be properly judged by present-day standards. Essentially the product of an extraordinary crisis in social and religious history, his personality and opinions were moulded by circumstances. As a theologian he cannot lay claim to any special eminence. As a social reformer he was perhaps unequivalled, but it was here that the defects of his qualities were specially manifest. For the work he undertook, his most remarkable endowment was that of eloquence. His appeals and denunciations were an important cause of the marvellous rapidity of the Protestant triumph. The best mirror, both of himself and of the Protestant aspect of his time, is that supplied by his own

*History of the Reformation in Scotland* (1584).

Knox, John Jay (1828-92), American financier, born at Knoxboro, N. Y. He was in charge of the Mint and Coinage Correspondence of the U. S. Treasury Department (1866-72), was deputy comptroller of the Currency

(1867-72), and comptroller (1872-84), and became recognized as a foremost authority on all matters pertaining to currency and coinage. It was he who prepared the original draft of the famous Coinage Act of Feb. 12, 1873. He was president of the National Bank of the Republic in New York City (1884-92). He wrote *United States Notes: A History of the Various Issues of Paper Money by the Government of the United States* (1884), which is a standard work on the subject.

Knox, Philander Chase (1853-1921), American lawyer and political leader, born in Brownsville, Pa. He was admitted to the bar in 1875, and became one of the leading lawyers of Pennsylvania, devoting his attention particularly to corporation law. In 1901 President McKinley appointed him Attorney-General of the United States, an office which he continued to hold under Roosevelt until his election to the U. S. Senate in 1904. As Attorney-General he was active in forming the Department of Commerce and Labor, in enforcing the Anti-Trust laws, and in securing clear title for the United States to the Panama Canal property. As Senator he was active and influential, especially in railroad rate legislation. In 1909 he was appointed Secretary of State by President Taft. He was active in negotiations with the powers for the establishment of a permanent international court of justice. He was the author of a resolution declaring peace with Germany, which, though vetoed by President Wilson, formed the basis of the later peace treaty. He died, Oct. 12, 1921.

Knox College, a co-educational institution at Galesburg, Ill. It was founded in 1837.

Knoxville, city, Tennessee, county seat of Knox co., on the Tennessee River. The chief educational institutions are the University of Tennessee, with which is affiliated the State Agricultural College, Knoxville College, Tennessee Medical College. Prominent buildings are the U. S. Custom House and the county court house. Industries include textiles, iron working, furniture, and marble finishing. Marble is quarried here, coal, iron, zinc, copper, lead, barites, clays, kaolin, and other minerals are found, a variety of timber trees abound. Knoxville was first settled in 1787 and was incorporated as a city in 1815, p. 111, 580.

Knudsen, William S. (1879- ), U. S. industrialist, born in Denmark. Named Production Management Director of the War Production Board in 1941-45.

Koala, or Native Bear (*Phascolarctus cinereus*), a clumsy and heavily built marsupial,

chiefly arboreal in habit, found in Eastern Australia, where it makes its home in the eucalyptus or 'blue gum trees'. The body is about two feet long and has thick, wooly fur, ashy gray in color above and white beneath. The ears are large and fringed, and the cheeks pouched for storing food. There is no tail. Structurally the koala resembles the phalangiers to which it is related. It is purely herbivorous.

**Kobbé, Gustav** (1857-1918), American author, was born in New York. He was graduated (1877) from Columbia, and studied for the bar, but soon turned his attention to music and dramatic criticism. He was editor of the *Musical Review*, music and dramatic critic of the *New York Sun* and *World*, editor of *The Lotus*, and author of numerous magazine articles. Among his books are *Ring of the Nibelung* (1889), *Wagner's Life and Works* (1890), *Signora* (1902), *Wagner's Music Dramas Analyzed* (1904), *Lives of the Great Composers* (1905), *Opera Singers* (1905), *Famous American Songs* (1906), *How to Appreciate Music* (1906), *Collection of Musicians' Portraits* (1909).

**Kobe**, city and seaport in the southern part of Honshu, Japan, on Osaka Bay. It is the second city in Japan in the value of foreign trade, being exceeded only by Yokohama. The city occupies a long narrow strip of land fronting the far-famed Inland Sea and flanked by densely wooded ranges of hills down whose ravines plunge many beautiful and picturesque waterfalls. It has clean, well-shaded streets, handsome buildings, electric lights, and street railways, and is in all respects one of the busiest and most attractive cities in the Far East. The harbor is excellent, and there is rail connection with all parts of the island. Kobe has an imperial ship building plant, a fine wharf for ocean-going craft, and two large dock-yards, employing thousands of workmen. Many manufacturing plants and small home workshops are scattered throughout the city, producing matches, paper, and glass. Exports include tea, refined camphor, peppermint oil, straw matting, porcelain, and buttons. In 1945 the city was heavily bombed by American B-29's and most of the industrial plants destroyed, p. 1,000,000.

**Koblenz**, or **Coblenz**, fortified town, Germany, capital of the province of Rhineland, is situated at the confluence of the Rhine and the Moselle. At the extremity of the tongue of land between the Rhine and the Moselle, stands an imposing monument to the Emperor William I, erected in 1897 by the province of Rhineland. Noteworthy buildings are the

Castor Church, originally founded in 836, rebuilt in the 12th century, the *Flornus Church* dating from the 12th century, the Church of Our Lady, founded in 1182, with a Romanesque nave of the 13th century and a Gothic choir of the 15th century, and the government buildings (1902-05). Industries include champagne making and the manufacture of pianos, hats and machinery, p. about 60,000.

At the close of World War I (1914-18) Koblenz was garrisoned for many months by American troops. In March, 1922, they were replaced by French troops.

**Koch, Robert** (1843-1910), German bacteriologist, was educated at Göttingen University. He served in the Franco-German War and at its close returned to Posen, where he had previously been practicing medicine and studying bacteriology. In 1880 he became a member of the Imperial Board of Health, and in 1883 Privy Councillor and Director of the German Cholera Commission, in which capacity he went to India and Egypt to study the disease. In 1885 he was appointed professor at the University of Berlin and director of the Institute of Hygiene, and in 1891 director of the Bacteriological Institute in Berlin. In 1905 he was awarded the Nobel Prize for achievements in physiology.

Koch contributed many important discoveries to bacteriological science. As early as 1876 he isolated the bacillus of anthrax, and some years later proposed a method of preventive inoculation against that disease. In 1882 he demonstrated the bacillus of tuberculosis which bears his name, and in the following year, in Egypt and India, identified the cause of cholera in the comma bacillus. In 1890 he produced tuberculin, a preparation from cultures of the tuberculosis bacillus, which has proved of great value as a diagnostic agent. He studied milder-pest in South Africa (1896, 1903), and there discovered a method of vaccination against the disease. He visited German East Africa in 1897 to study malaria, and in 1905 to investigate sleeping sickness.

**Kochi**, town, Honshu, Japan, on the sea coast of Shikoku Island, p. 39,000.

**Kock, Charles Paul de** (1794-1871), French novelist, wrote chiefly about the bourgeois class of Paris, author of *Gustave* and *Mon Voisin Raymond*.

**Kodama, Gentaro, Viscount** (1852-1906), Japanese soldier and statesman, was born in Choshu. He supplemented his Japanese training by study in the United States (Rutgers College) and in Europe. He became vice minister of war (1892), governor-general of Formosa

(1897), Minister of War (1900), and Minister of Home Affairs (1903). He prepared the plans on which the war with Russia was fought, and during the war showed himself to be one of the ablest of the Japanese strategists.

**Kodiak**, island, lying off Cook Inlet, Alaska, 500 m from Sitka. It is about 100 m long and 50 m wide and the interior is lofty and bare. Fur animals and salmon abound, the Kariuk River being the best salmon stream of Alaska. The U. S. Department of Agriculture uses a part of the island as a breeding range for cattle and sheep, adapted to the extreme northern climates, and also for reindeer. The largest towns are Kariuk and Kodiak.

**Kodiak Bear**, a distinct species of American bear, the largest of existing carnivora, living on Kodiak Island. This animal frequently weighs 1,200 pounds, and sometimes as much as 1,500 pounds. The length of a good sized specimen is about 10 ft., the breadth across the extended front paws about 11 ft.

**Koenig, Georg Augustus** (1844-1913), American chemist and educator, was born in Willstedt, Baden, Germany, and was graduated from Heidelberg (1867). The following year he went to the United States, and after field work among the Mexican mines was instructor and professor of chemistry and mineralogy at the University of Pennsylvania from 1872 to 1892. In 1892 he became professor of chemistry at the Michigan College of Mines. He discovered several new minerals and a new method of assaying.

**Kofu**, town, Honshu, Japan. Its chief industry is the weaving of silk. Rock crystals are cut and polished, p. 68,275.

**Koh-i-nur**, (Pers., 'Mountain of Light'), a magnificent diamond weighing 104 carats, one of the British crown jewels. See DIAMOND.

**Kohl-rabi** (*Brassica caulorapa*), a member of the cabbage family, cultivated on account of its swollen, fleshy, turnip like stem. When quite young it has the flavor of turnip, and may be stored for a winter vegetable.

**Kohlrausch, Friedrich** (1840-1910), German physicist, was born in Rinteln, and after holding several chairs of physics (Göttingen, Würzburg, Strassburg) was appointed (1895) president of the Imperial Technical College at Charlottenburg. Besides numerous monographs on physical subjects, chiefly in connection with the theory of electrolysis, he published a book, translated into English under the title of *An Introduction to Physical Measurements*.

**Kokomo**, city, Indiana, county seat of How-

ard county. The more important manufactures include automobiles and accessories, glass, lumber and steel products. Kokomo was named for Chief Kokomo of the Miami Indians, the first settlers on the present site of the city, p. 33,795.

**Koko-nor**, lake and region of Central Asia. The lake is 60 m in length by 40 m in breadth. On a rocky island in the centre is a Buddhist temple frequented by pilgrims. The region lies between Tibet, China, and the Gobi desert, and is sometimes understood to include not only the basin of Koko-nor itself, but also the upper valley of the Huang-ho or Yellow River.

**Kola**, town, Russia, in the government of Archangel, on the Kola peninsula, at the head of the Gulf of Kola. It is one of the most northerly of European settlements, but its harbor is comparatively ice-free all the year. In 1899 it was superseded as a capital by the new port of Alexanderovsk or Ekaterinsk, near the mouth of the Gulf of Kola. Here or in the immediate vicinity, in 1918, British, French, and American marines landed to protect munitions and provisions originally intended for the Russian government, p. about 650.

**Kolaba**, a district of India, southern division of Bombay. Area, 2,130 sq m, p. 610,000.

**Kola Nut**, or **Guru Nut**, the fruit of a tropical African tree, *Cola Acuminata*, belonging to the order Sterculiaceae. The nuts, or more properly seeds, are red or white in color when fresh, rather larger than walnuts, and have a bitter taste. They contain a large quantity of caffeine, and are used by the natives as a stimulant, and also medicinally. They enter largely into the ceremonies of the natives, and the trees are held in great regard. In Europe and America the kola nut has been used with cacao in making a beverage.

**Kolar**, town, Mysore, India, capital of the district of the same name. In the vicinity is the Kolar gold field district in which the gold mines of Mysore are located, p. 48,600.

**Kolarian**, a conventional term first applied in 1866 by Sir George Campbell to numerous hill tribes of Central India (Chota Nagpur, the Vindhya uplands, Mirzapur, etc.), who are regarded by many as the true aborigines of the peninsula, or at least its earliest known occupants. The word *kol* is the basis of our word *coolie*.

**Kolberg**, seaport and seaside resort, Prussia, in the province of Pomerania, 2 m from the Baltic coast and 76 m by rail from Stettin. It was formerly strongly fortified. Of interest

is the Cathedral of St Mary's, a vast Gothic structure of the 13th-14th century, p 33,000

**Kolchak, Vladimir Vasilievitch** (1874-1920), Russian admiral, who distinguished himself during the Russo-Japanese War in the defence of Port Arthur, and in the World War as vice-admiral and commander of the Black Sea fleet. After the Bolshevik uprising of 1917, he was the military leader of the 'Whites,' the anti-Bolshevik forces, but his first victories were followed by defeats, leading to his capture in 1920 and immediate execution.

**Kolhapur**, capital of a feudatory state of the same name, Bombay Presidency, India 97 m w of Bijapur. The picturesque town contains the remains of several Buddhist shrines dating from the 3d century B.C. It has several fine public buildings, p 55,600. Kolhapur state has an area of 3,217 sq m, and a population of 833,726.

**Kolin**, town of Bohemia, on the Elbe. The Church of St Bartholomew, with a beautiful Gothic choir, is the most notable building. Kolin is a centre of the Bohemian sugar industry, and manufactures chemicals, machinery and beer. Here, on June 18, 1757, Frederick the Great was defeated by the Austrians, p 43,950.

**Kollar, Jan** (1793-1852), Slovak poet, was born in the county of Thurocz, Hungary, was a pastor in Pest (1819-49), then professor of archaeology at Vienna until his death. His writings did much to awaken the national feelings of the Slovaks in particular, and the sense of community of race among the Slavs in general. The most important of these were *Slávy Dcera* (1816) a series of original sonnets, *Národné Zpěvanky* (1832-3), a collection of Slovak folk songs.

**Kolliker, Albrecht von** (1817-1905), German-Swiss histologist, was born in Zurich, and became professor of anatomy at Würzburg (1847-1902). He was responsible for the *Challenger Report on Pennatulida* (1870).

**Kolmar**, town, France, in Alsace-Lorraine, capital of the department Haut Rhin, on the river Luch. It is a characteristic Alsatian town, with picturesque timbered houses. Places of interest are the Musée, the Gothic Cathedral of St Martin, the Hotel de Ville, and the Dominican Church, p 42,255.

**Koln** See Cologne

**Kolomea**, town, Poland, on the left bank of the Pruth. It has petroleum, pottery, and candle industries and a large agricultural trade. It formerly belonged to Austrian Galicia, but at the close of the Great War (1914-18) was awarded to Poland, p 41,400.

**Kolomna**, town, Russia, government of Moscow. It is the seat of a Greek orthodox bishop and has a 14th century church as well as a beautiful cathedral and ruins of the fortified Kremlin. The celebrated marmalade called 'postilla' is manufactured here, p 31,000.

**Kolozsvár** (Ger *Klausenburg*, Rum *Cluj*), town, Rumania, on the Little Szamos river. Features of interest are the citadel, several old churches, the Brâncuș Palace, the industrial building, and the university. Kolozsvár was founded by Saxon colonists in 1272 and was long the capital of Transylvania. In 1848 it was captured by Hungarian revolutionists, at the close of World War I (1914-18) it was included in Rumania. It was the birthplace of Matthias Corvinus, p 60,808.

**Koltsoff, Alexei Vasilievitch** (1809-42), 'the Russian Burns,' was the son of a cattle dealer at Voronezh. He taught himself, managed his father's business and published verses of marked originality and rare beauty. He is the poet of the steppe and of peasant life. For English translations consult Wiener's *Anthology*.

**Kolyma**, river of Eastern Siberia navigable for about 720 m, rises in the Stanovoi range, flowing N.E. for 1,000 m, and discharging into the Arctic Ocean through a wide estuary.

**Komárom**, (Ger *Komorn*), town Czechoslovakia, at the confluence of the Vág (Waig) with the Danube. It successfully resisted the Turks in 1594 and 1663, and made a stubborn but unsuccessful resistance to the Austrians in 1848-9. The novelist Jókai was born here in 1825. Until the close of the Great War Komárom belonged to Hungary, p 20,000.

**Komura, Jutarō, Marquis** (1855-1911), Japanese statesman. He was graduated from Harvard University in 1877 and on his return to Japan was appointed a judge in Osaka. He became first secretary of foreign affairs in 1884, was then secretary of the legation in China, and just before the Sino-Japanese war became acting minister there. After the war he was successively chargé d'affaires and minister in Korea, minister to the United States, Russia, and China, minister of foreign affairs, chief plenipotentiary to arrange the peace of Portsmouth (1905), and ambassador to Great Britain (1906-08). From 1908 until his death he was again minister of foreign affairs.

**Kongo** See Congo

**Kongsberg**, town, Norway, county of Buskerud, on the Lågen. It has silver mines, and one of the most beautiful churches in Norway, p 6,132.

**Konieh**, or **Konia** (anc *IIconium*), town, Asiatic Turkey. It has many mosques, a Byzantine church, a massive **Konik**, one of the finest government buildings in Turkey, and the remains of Sultan Alā ed-din's palace. It is commercially important, controlling the trade of an extensive territory. From the capture of Nicaea by the Crusaders (1097) down to the time of Genghis Khan, Konieh was the capital of the Seljuk (Turkish) sultans. Paul and Barnabas on their first missionary journey preached here. It is the seat of a Greek archbishop, p 60,000. See **ICONIUM**.

**König, Friedrich** (1774-1833), German inventor. He patented a steam printing machine (1810), and a cylinder press, which turned out 1,200 copies of the *London Times* in an hour. He established near Würzburg a factory for making printing presses, which became known throughout the countries of Europe.

**Königgratz**, town of Bohemia, on the Elbe River. It has a Gothic cathedral (Roman Catholic) founded in 1302. Here was fought, July 3, 1866, the Battle of Sadowa in which the Austrians were defeated by the Prussians, p 11,000.

**Königsberg**, town, Prussia, on the Pregel 25 m from the Baltic with which it is connected by a canal to Pillau, its outer port. The second capital and place of residence of the kings of Prussia, Königsberg is the most important town in the n.e. It houses the provincial supreme court, the archives and the museum of antiquities. Other features are the university, founded in 1544 and completed in 1862, the cathedral, a Gothic structure begun in 1325, and the palace chapel where Frederick I crowned himself king of Prussia (1701) and in which William I was crowned (1861). Königsberg was originally a fortress of the Knights of the Teutonic Order (1255). The philosopher Kant lived and labored here (1724-1804). In the First World War Königsberg was attacked by the Russians, August, 1914, but was successfully defended by the German forces, p 292,000.

**Königsbütte**, town, Upper Silesia, some 7 m from the old Russian frontier, renamed Krolewski, when ceded to Poland, under the Versailles Treaty. It is a center of the great coal, iron, zinc and copper industries of Upper Silesia, p 78,600.

**Königsstuhl**, castle beside the Rhine, Germany, 5 m s of Koblenz, at a spot where the territories of the four Rhenish electors (Cologne, Treves, Koblenz, and Palatine) met. Here, from early ages down to the fifteenth

century, the electors sometimes assembled to choose the future emperor. The original castle was built in 1376 and restored in 1843.

**Konioscope**, an instrument for indicating the quantity of dust in the atmosphere. The air to be tested is drawn into a tube, where it is moistened and cooled by expansion, thus condensing moisture on the dust particles and rendering them visible as a fog or haze. The depth of color indicates the degree of impurity.

**Konkan**, a strip of country about 200 m in length along the w. shore of the Bombay Presidency, India, devoted to rice fields, coconut plantations, and salt pans.

**Konoye, Prince Fumimaro** (1891-1945), Prime Minister in Japan. In disagreement with the war lords, he resigned July 16, 1941. On the eve of trial he committed suicide.

**Konstanz**, or **Constance**, town, grand-duchy of Baden, Germany, lies at the north-western extremity of Lake Constance, where the Rhine flows from that body of water. It contains many interesting old buildings, among which may be mentioned the Munster, begun in the 11th century and altered in the 15th and 17th centuries, the Rathaus (14th century), now a restaurant, the Rathhaus, containing the archives of the city, Hotel Barbrösser, in which Frederick I signed the peace with the Lombards (1183), the Rosgarten, once the guild house of the butchers, the Dominican Monastery, in which Huss was imprisoned. The chief industries are textile factories, iron works, chemical works and carpet weaving. John Huss and Jerome were burned for heresy, here in 1415 and 1416, p 31,250.

**Konti, Isidore** (1862-1938) sculptor came to America in 1891, and in 1893 took up residence in New York City. A number of groups for the Columbian Exposition at Chicago (1893) assured his reputation as an artist of great ability. These were followed by other works including the *Edward Beale* and *Kil Carson* monuments in Washington (National Museum), *West Indies*, for the Dewey Arch in New York City, *Justinian the Great*, *Alfred the Great*, a relief and a group—*South America*—for the Pan American Building in Washington, the McKinley monument in Philadelphia (with Ch. Lopcz), *The Genius of Immortality*, in the Metropolitan Museum, and many tablets, statuettes and reliefs for private collections.

**Koo, Vi-kuyun Wellington**, (1887- ), Chinese statesman. He received his doctorate of philosophy at Columbia University, was secretary to President Yuan Shi kai, Chinese



Minister to Washington (1915), head of the Chinese delegation to the Paris Peace Conference and representative in the assembly of the League of Nations, Minister to Great Britain (1921), delegate to the Washington Disarmament Conference (1921-22), Minister of Foreign Affairs, Finance Minister, and Premier of China (1922-1927), and appointed in 1927 to be China's representative on the International Court of Arbitration at the Hague. He was ambassador to Great Britain 1941-46, to U S 1946-

**Kootenay**, a group of Indians living in Southeast British Columbia and Northern Montana and Idaho

**Kootenay River**, British Columbia, rises in the Rocky Mountains, and flows at first s, nearly parallel to the Columbia, then makes a loop into Montana and Idaho, recrosses the Canadian boundary, flows through Kootenay Lake, and joins the Columbia after a course of 400 m. Throughout its basin gold is found, and there are rich deposits of iron. Its navigation is obstructed by rapids.

**Kopek**, or **Copek**, a Russian copper coin worth the hundredth part of a rouble.

**Koptos**, town, Upper Egypt, situated on the right bank of the Nile, between Kenh and Luxor. In early times it was the starting point of a caravan route between the Nile and ports on the Red Sea and was of great commercial importance.

**Koran**, the sacred book of Islam, is made up of revelations which its founder, Mohammed, professed to have received from time to time direct from God, and which were compiled after his death by his secretary Zaid-ibn-Thabit. About seventeen years later Othman, the third caliph, had the text carefully revised, and put forth the edition which has been used ever since.

The Koran is written in Arabic and consists of 114 suras, or chapters, which vary in length from a few lines to many verses. In the earliest compositions we discover the fragmentary impassioned utterances of an embryo prophet—appeals to his countrymen to return to the worship of God, 'the Compassionate, the Merciful'. In the second group the unity of the God-head is proclaimed, idolatry is denounced and vivid pictures are drawn of judgment, of heaven, and of hell. In the third group Mohammed lays stress on the divine character of his mission. In the next group—Mecca suras—we find a militant Islam appealing to the arbitrament of the sword. Finally, in the Medina suras, we have Islam triumphant, fasts, festivals, and the pilgrimage to Mecca

are instituted, and the slaughter of all 'infidels' is authorized. The style is difficult and the meaning is often obscure, but there are passages of surpassing power and grandeur, of true poetry, and of lofty moral teaching. See **MOHAMMED**, **MOHAMMEDANISM**.

**Kordofan**, province, Anglo-Egyptian Sudan, lies between Darfur and the White Nile. The surface is generally undulating, with a few isolated peaks and mountain groups. There are no rivers, and in the dry season the land is practically desert, but during the wet season (June to October) vegetation is luxuriant. The chief products are groundnuts, cotton, tobacco, and millet, the principal exports are ostrich feathers, gum arabic, ivory, and ox hides. The population is about 300,000, chiefly Arabs and Nubas. The capital is El Obeid.

**Korea**, **Chosen**, or **Taihan**, a country in Eastern Asia, forming a long narrow peninsula extending s.e. of Manchuria, between the Yellow Sea on the w. and the Japan Sea on the E. It is about 600 m. long by 135 m. broad, has a coastline of 1,740 m., and an area of nearly 85,000 sq. m. It was annexed to Japan in 1910, and was an integral part of Japan 1919-45.

Korea is generally mountainous. Alpine ranges hem it in on the n., and a lofty chain follows the eastern coast from n. to s., rising abruptly from a narrow coastal plain. The east coast is high and mountainous, the sea is almost tideless here, and there are few islands and harbors, the south and west shores, on the other hand, are deeply indented and are beset by picturesque islands.

Chemulpo, the port of Seoul, on the west, and Fusan, in the south, are the most important harbors. The principal rivers are the Tuman and Yalu, or Amnok, in the north, the Taikong, Han, and Keum in the west, and the Nakdong in the southeast. All are navigable for some distance, except in winter, when they become frozen over.

The climate is generally healthful and delightful. The soil is fertile in the western and southern parts of the peninsula. Forests cover the northern and eastern parts, pine, oak, elm, beech, paper-mulberry, willow, lime, ash, and maple trees are found. Granite, limestone, soapstone and slate occur, and gold, silver, copper, coal, and iron are mined.

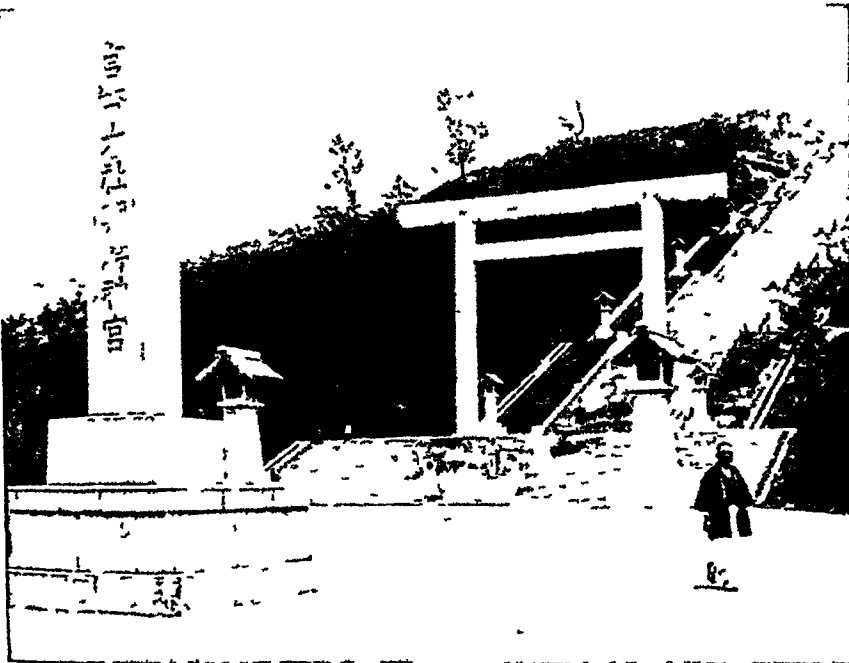
Agriculture is the chief occupation of the people. Rice, beans, pers., millet, wheat, barley, tobacco, cotton, ginseng, and potatoes are raised. Rice is the most important crop. The soil is suited to the mulberry tree.

and it thrives well. Silkworm rearing is extensively carried on. Cattle raising is a flourishing and rapidly developing industry, with livestock enumeration in a recent year including over 1,700,000 cattle.

*Fishing* is second only to agriculture as an industry. Ling, haddock, salmon, sea-slugs, cod, sharks, and whales abound in the surrounding water. The Japanese, having obtained from the Korean government the right to fish anywhere along its coast, have far outdistanced the natives in the whaling industry. The 1940 sea fish catch amounted to nearly

nected with the Chinese and Siberian lines. The highway system included in 1941 nearly 16,000 m. of graded earth or gravel roads. An air line was in operation between the chief cities and Japan and Manchukuo, now Manchuria. Shipping tonnage, entering the ports, reached a figure over 15 million.

*People, Religion, Education*—The population of Korea is 22,899,000, a large proportion now being Japanese. The Koreans are apparently a mixed race, Mongolian, Malay, and Aino. The written language is Chinese and whatever literature exists is in that language.



*Shinto Shrine, near Seoul, Korea*

a billion and three quarters metric tons.

*Manufacturing* is steadily increasing. Textiles, paper, and ginseng are the principal products, with many new industries developing.

*Minerals* are gold, with several mines in operation, copper, coal, and iron in abundance, and silver, zinc, lead, tungsten ore, and graphite, all simply waiting for the development of improved transportation for exploitation and shipping.

*Transportation* is carried on mainly by pack-horses and oxen, especially in the interior. Roads are being constantly improved. There were in 1941 about 3,000 m. of railways con-

Some of the Koreans are followers of Confucius and there are many Buddhists, but Buddhism has never had a strong hold on the people. Ancestor worship is observed. Christianity has found Korea a fertile field. *Education* is gaining rapidly, with common schools for Koreans and for Japanese, many private common schools, many vocational and higher schools, and the University of Seoul. There are many Christian mission schools and hospitals.

*History*—The native annals begin in 57 B.C., but have little historical value until the second half of the 4th century, a period of great prosperity during which writing and

Buddhism were introduced from China, to whom Korea owes its civilization and arts. Early in the 10th century Kokuryo was resuscitated under the name of Koryo (our Korea), and soon became master of the peninsula.

In 1392 the dynasty recently ended was founded, and the country was called Cho-sen. The nation steadfastly refused to hold communication with the outside world and suffered from various punitive expeditions which had the further object of extorting treaties. During the early part of this treaty-making period which brought Korea out from her position of a Hermit Nation, China still insisted upon her claim of suzerainty. This claim led to two conflicts with Japan. Japan, however, soon lost the position of supremacy in Korea which she had obtained through this war, and Russian influence became paramount. This was one of the crises of the Russo-Japanese War of 1904-5, as a result of which Japan again obtained complete mastery of the Korean situation. The difficulty of administering the Korean government under any other system led Japan to announce a formal treaty of annexation in August, 1910. The Japanese at once set about the development of the country with characteristic thoroughness, introducing far-reaching reforms in matters of administration, public health, education, and the agricultural and industrial life of the country. Following the armistice which ended World War I, the Japanese government announced a policy including the abolishment of racial discrimination and non-interference with freedom of speech and press. Korea was freed at the end of World War II. The Russians occupied the northern half, U. S. forces the southern half, pending plans for independence.

**Koriaks**, a Mongolian tribe inhabiting a district of Northeastern Siberia, between the Chukches and the Kamchadals. They number about 5,000, chiefly fishermen, and nomadic and semi-nomadic herdsmen.

**Korner, Karl Theodor** (1791-1813), German poet and patriot was born at Dresden, the son of Christian Korner, a German jurist and friend of Schiller. In 1811 he was appointed dramatist to a Viennese theatre, but when Prussia roused herself against Napoleon in 1813, Korner joined Lützow's black-uniformed guerrilla troop, and died the patriot's death at Wobbelin, not far from Schwerin. He occupies almost a holy place in the hearts of his countrymen by reason of the fiery patriotic songs with which he encouraged his fellow-fighters, they have been collected as *Leier und Schwerter*

(1814, numerous editions since). He also wrote several bright little plays, such as *Der grüne Heinrich*, *Toni*, *Der Nachtwächter*, and two or three tragedies.

**Korniloff, Laurus Gregorovitch** (1870-1918), Russian general, was born in Siberia. In 1917 he was appointed generalissimo of the Russian Army. In December he aided General Kaledin in declaring war against the Bolsheviks, and in June, 1918, was instrumental in the defeat of the Bolshevik government at Moscow.

**Korolenko, Vladimir** (1853-1921), Russian writer. He was educated at St. Petersburg, and at the Academy of Agriculture in Moscow. In 1879 he was exiled as a 'political' to Viatka, thence to Kama, later to Tomsk, and finally to Irkutsk in Eastern Siberia. In 1885 he returned and settled in Nijni-Novgorod. He later became editor of the *Russkoje Bogatstvo*. His principal works are *Sketches of a Siberian Tourist*, *In Bad Company*, *The Murmuring Forest*, *The Blind Musician*, *The Dream of Makar*, and the autobiographical *History of My Contemporary*.

**Kosciuszko, Tadeusz** (1746-1817), Polish general and statesman, was born in Siechnowice in Lithuania. He went to America (1776), where he served under Washington in the Revolutionary War, and became the friend of Lafayette. He returned to Poland in 1786, and in 1792 led a force against the invading Russians. In 1794 he was made commander-in-chief by the nobles in Cracow. All classes rallied to his standard, and he defeated the Russians at Racowice, was made Dictator of Poland, defended Warsaw for two months, but was defeated and taken prisoner at Maciejowice. He was held at St. Petersburg until the death of the Empress Catherine in 1796. After visits to England and America, where he was received with great enthusiasm, he settled in France. There is a monument to him at West Point.

**Kosher**, a term in use among the Jews, signifying that an article is clean and lawful, conforming to the ordinances of the Talmud in its preparation. It is applied especially to meat, 'kosher meat' being meat killed and prepared by Jews after the Jewish manner and so fit to be eaten by Jews.

**Kossel, Albrecht** (1853-1927), German physiologist, was awarded the Nobel Prize in Medicine in 1910 in recognition of his biochemical researches. His chief work was the study of the chemical composition of the cell, and he made valuable contributions to the literature of physiological chemistry.

